# FOOD Manufacture

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Vol. XXXV No. 12 DECEMBER 1960

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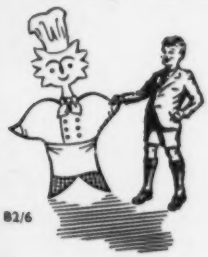

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... in all ways. Today, super-markets and frozen foods—what of tomorrow? He will grow up with Mr. Therm, for each advance made by Catering Managements and Food Manufacturers will be helped by the unceasing research of the Gas Industry towards new and improved equipment.
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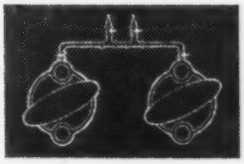

**DUAL STATIONS can be supplied for continuous filling.**

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Continuous *vacuum sausage linker*.

Air, water or hydraulic filler. Typical prices from a large range:- ▶
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S.L.200,440 lb. capacity, **£1,034** delivered.

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# Index to ADVERTISERS


| | Page |
|---|---|
| Advita, Ltd. | Oct. |
| Agricultural & Chemical Products, Ltd. | A74 |
| Aiton & Co., Ltd. | A66 |
| Albrin Products, Ltd. | Nov. |
| Albro Fillers & Engg. Co., Ltd. | A56 |
| Alfa-Laval Co., Ltd. | Nov. |
| Allen, Stafford, & Sons, Ltd. | A37 |
| Alloa Glass Works Co., Ltd. | A13 |
| Allspeeds, Ltd. | A23 |
| Amasal, Ltd. | A68 |
| Amber Oils, Ltd. | Nov. |
| A.P.V., Co., Ltd. | Nov. |
| Associated Metal Works, Ltd. | A70 |
| Baker Perkins, Ltd. | A15 |
| Barron, W. S., & Son, Ltd. | Oct. |
| Barry Wehmiller & Co., Ltd. | Oct. |
| Beddington Nut & Produce Co., Ltd. | A65 |
| Begg, Cousland & Co., Ltd. | A30 |
| Bellingham & Stanley, Ltd. | A73 |
| Benjamin Electric, Ltd. | Sept. |
| B.E.N. Patents, Ltd. | Oct. |
| Bliss, E. W. (England), Ltd. | Nov. |
| Boehm, Fredk., Ltd. | Nov. |
| Boulton, William, Ltd. | A62 |
| Bramwell, S., & Co., Ltd. | Nov. |
| Brierley, Wm., Collier & Hartley, Ltd. | A6 |
| British Arkady Co., Ltd. | Nov. |
| British Belting & Asbestos, Ltd. | Nov. |
| British Cellophane, Ltd. | Cover 3 |
| British Dairy Farmers Assn. | Oct. |
| British Hydrological Corporation | Nov. |
| British Nylon Spinners, Ltd. | A53 |
| British Rayophane, Ltd. | A48 |
| British Sidac, Ltd. | A12 |
| British Soya Products, Ltd. | A69 |
| British Transport Commission | A62 |
| British Vacuum Cleaner & Engg. Co. | Aug. |
| Broadbent, Thomas, & Sons, Ltd. | Nov. |
| Brown & Polson, Ltd. | Oct. |
| Bryan, Wm., Ltd. | A28 |
| Bush, W. J., & Co., Ltd. | Nov. |
| Busse, Paul | Sept. |
| Butter Information Council | A51 |
| Butterfield, W. P., Ltd. | A59 |
| Butterley Co., Ltd. | A22 |
| Caleb Duckworth, Ltd. | A20 |
| Calfos, Ltd. | Nov. |
| Cambridge Instrument Co., Ltd. | Nov. |
| Cascelloid | Nov. |
| Caxton Chocolate Co., Ltd. | Oct. |
| Clarke, George, & Co., Ltd. | Oct. |
| Coates Bros. Ink, Ltd. | Nov. |
| Cohen, Geo., Sons & Co., Ltd. | Oct. |
| Colt Ventilation, Ltd. | Nov. |
| Commer Cars, Ltd. | Nov. |
| Conveyor & Shotblast, Ltd. | A27 |
| Cooper, McDougall & Robertson, Ltd. | Aug. |
| C.P. Equipment, Ltd. | Nov. |
| Cradley Boiler Co., Ltd. | Oct. |
| Crofts (Engineers), Ltd. | A29 |
| Crompton Parkinson, Ltd. | Sept. |
| Crookes Laboratories, Ltd. | Nov. |
| Cuxson, Gerrard & Co., Ltd. | A69 |
| Dallow, Lambert, Ltd. | A57 |
| Daniels, S., & Co., Ltd. | A70 |
| Dawson Bros., Ltd. | Nov. |
| Dodge Bros. (Gt. Britain), Ltd. | Oct. |
| Dodman, Alfred, & Co., Ltd. | A32 |
| Drakesons | A76 |
| Dring, J., Ltd. | Nov. |
| Duche, T. M., & Sons, Ltd. | A58 |
| Elliott Bros. (London), Ltd. | A21 |
| English Grains Co., Ltd. | Oct. |
| Fisher's Foils, Ltd. | Cover 2 |
| Flexibox, Ltd. | Nov. |
| Florasynthe Laboratories (England), Ltd. | Nov. |
| Foodtech, Ltd. | A3 |
| Foster Instrument Co., Ltd. | Nov. |
| Fraser, J., & Son, Ltd. | Nov. |
| Freeman, Taylor Machines, Ltd. | Aug. |
| Frigidaire Division of General Motors, Ltd. | Sept. |
| Fuller Horsey, Sons & Cassell | A73 |
| Gas Council | Cover 1 |
| Gascoigne & Kingston, Ltd. | Oct. |
| Glass Manufacturers' Federation | A7 |
| Gordon & Gotch (Sellotape), Ltd. | A31 |
| Greening, N., & Sons, Ltd. | Nov. |
| Gummers, Ltd. | A32 |
| Gunson, R. W., (Seeds), Ltd. | A20 |
| Haas Vakuum-Technik (G.m.b.H.) | A70 |
| Hart, W. J., Ltd. | Nov. |
| Heston Equipment Co., Ltd. | Oct. |
| Hodgson, Richard, & Sons, Ltd. | Nov. |
| Holmes, W. C., & Co., Ltd. | Nov. |
| Honeywell Controls, Ltd. | Oct. |
| Hopkinson, Ltd. | Nov. |
| Howard Pneumatic Engg. Co., Ltd. | A28 |
| Hunt, John, (Bolton), Ltd. | A24 |
| I.C.I. | A43 |
| Industrial & Commercial Finance Corporation, Ltd. | A24 |
| Industrial Tapes, Ltd. | Nov. |
| IMC S.A. International Machinery Corpn. | A46-A47 |
| Iridon, Ltd. | A64 |
| Isopad, Ltd. | Sept. |
| I.S.I.S., Appointments Register | A71, A72 |



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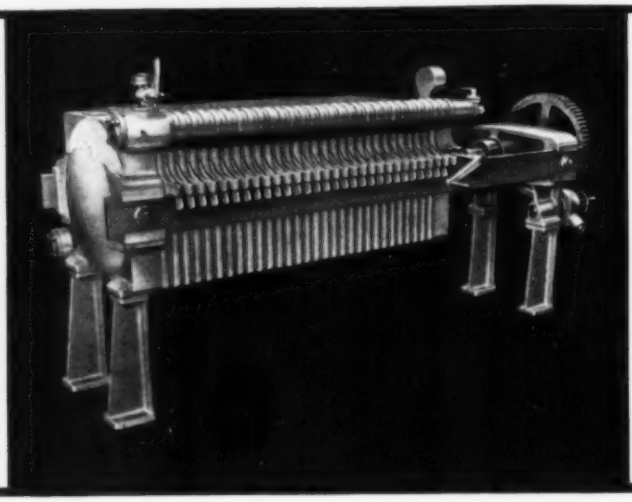

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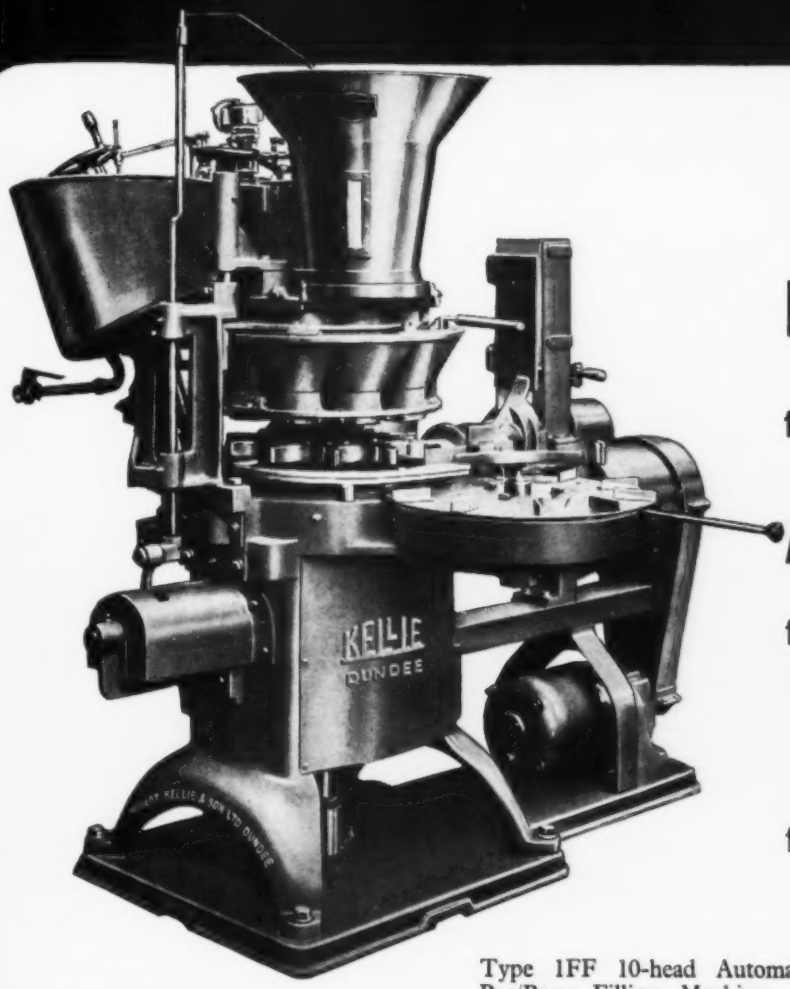


Type 1FF 10-head Automatic Pea/Bean Filling Machine.

## This new Kellie model

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# Index to ADVERTISERS


| | Page |
|---|---|
| Jackson Bros. (Knottingley), Ltd. | A26 |
| Jackson, J. G., & Crockatt, Ltd. | Nov. |
| Jenner, A. & C., Ltd. | A63 |
| Johnson, A., & Co. (London), Ltd. | Nov. |
| Johnson, S. H., Co., Ltd. | A4 |
| Johnston Lightning Filler Co., Ltd. | Oct. |
| Jones, Samuel, & Co., Ltd. | A45 |
| Karrier Motors, Ltd. | A55 |
| Kellie, R., & Son, Ltd. | A5 |
| Kemball Bishop & Co., Ltd. | Sept. |
| Kendall, F., & Son, Ltd. | A68 |
| Kestner Evaporator & Engg. Co., Ltd. | Sept. |
| Key Glassworks, Ltd. | Oct. |
| King, George W., Ltd. | Nov. |
| Kingston upon Hull Development Committee | Oct. |
| Kirby-Cooper (Glucose), Ltd. | A35 |
| Kork-n-Seal, Ltd. | Nov. |
| Lambert, L., & Co., Ltd. | A65 |
| Loders & Nucoline, Ltd. | A67 |
| London Fumigation Co., Ltd., The | Nov. |
| Lyon, Arthur, & Co. (Engrs.), Ltd. | A58 |
| Manesty Machines, Ltd. | A61 |
| Mardon, Son & Hall, Ltd. | Aug. |
| Marley Concrete, Ltd. | Nov. |
| Mason & Morton, Ltd. | Oct. |
| Mather & Platt, Ltd. | A14 |
| May & Baker, Ltd. | Nov. |
| Measurement, Ltd. | Aug. |
| Metal Box Co., Ltd. | A33, A38 |
| Metal Closures, Ltd. | Nov. |
| Metal Propellers, Ltd. | Oct. |
| Milk Products (N.Z.), Ltd. | Nov. |
| Mitchell, L. A., Ltd. | Oct. |
| Mittlehauser & Walter | Cover 4 |
| Mono Pumps, Ltd. | Nov. |
| Monsanto Chemicals, Ltd. | Nov. |
| Moore, J. W., & Co., Ltd. | A73 |
| Munton & Fison, Ltd. | A40 |
| Myers, Fred., Ltd. | A11 |
| National Glass Works (York), Ltd. | A19 |
| Negretti & Zambra, Ltd. | Nov. |
| Newman Labelling Machines, Ltd. | Nov. |
| Norman Engg. Co. | A54 |
| Oakes, E. T., Ltd. | A56 |
| Oxoid Division of OXO Ltd. | Sept. |
| Packaging Machinery (Peters), Ltd. | Aug. |
| Padley & Venables, Ltd. | Nov. |
| Permoglaze, Ltd. | Nov. |
| Pickfords | A68 |
| Plenty & Son, Ltd. | A16 |
| Polak & Schwarz (Eng.), Ltd. | Nov. |
| Premier Filterpress Co., Ltd. | A73 |
| Rapid Magnetic, Ltd. | Sept. |
| Rayner & Co., Ltd. | Oct. |
| Realm Engg. Works, Ltd. | Nov. |
| Remploy, Ltd. | Nov. |
| Roche Products, Ltd. | A9 |
| Rozalex, Ltd. | Nov. |
| Russell Constructions, Ltd. | Sept. |
| Samuelson, P., & Co. | Oct. |
| Saunders Valve Co., Ltd. | A25 |
| Sauven Perforating Machine Co., Ltd. | A30 |
| Scan, Ltd. | Nov. |
| Sharples Centrifuges, Ltd. | Nov. |
| Signode, Ltd. | A50 |
| Simon, Henry, Ltd. | A18, A60 |
| Skerman, C., & Co., Ltd. | A75 |
| **SMALL ADVERTISEMENTS** | A74-A76 |
| Soflor Ltd. | A34 |
| Soya Foods, Ltd. | Nov. |
| Spesco Development, Ltd. | A60 |
| Stainless Steel Plant, Ltd. | Nov. |
| Stainless Steel Pumps, Ltd. | Nov. |
| Steel Co. of Wales, Ltd., The | A42 |
| Stevenson & Howell, Ltd. | Nov. |
| Stokes & Dalton, Ltd. | A17 |
| Sturge, J. & E., Ltd. | Nov. |
| Taylor Rustless Fittings Co., Ltd. | Nov. |
| Technoexport | A10 |
| Thames Board Mills, Ltd. | Sept. |
| Thompson (Wilson Boilers) John, Ltd. | A8 |
| Turner Bros. Asbestos Co., Ltd. | A52 |
| Unigate (Milk Products) Ltd. | Nov. |
| United Glass, Ltd. | A39 |
| Venesta Foils Ltd. | Nov. |
| Viscose Development Co., Ltd. | A41 |
| Vitamins, Ltd. | A52 |
| Vulcan Foundry, Ltd. | A49 |
| Warwick Production Co., Ltd. | Nov. |
| Webster, I., & Sons, Ltd. | Nov. |
| Welch, J. A., Ltd. | Sept. |
| Wetter, J. C., & Co., Ltd. | A30 |
| White Child & Beney, Ltd. | Aug. |
| White, Tomkins & Courage, Ltd. | A44 |
| Whittaker, Arthur | A74 |
| Wiggins Teape (Mill Sales), Ltd. | Sept. |
| Willcox, W. H., & Co., Ltd. | A36 |
| Williams (Hounslow), Ltd. | A54 |
| Worthington Simpson, Ltd. | Nov. |
| Wright Hargreaves, Ltd. | Nov. |
| Wynmouth Lehr & Co., Ltd. | A73 |
| Youngman, W. C., Ltd. | A68 |
| Zimmerman, C., & Co., Ltd. | A69 |

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*If you would care to have further details of this service, please do not hesitate to ask, irrespective of whether your interest is immediate or not. Your Glass Container Manufacturer will be happy to discuss your problem and to help you in any way. Details of this scheme have been published as a booklet, copies of which are available on request from your Glass Manufacturer or from the Federation.*

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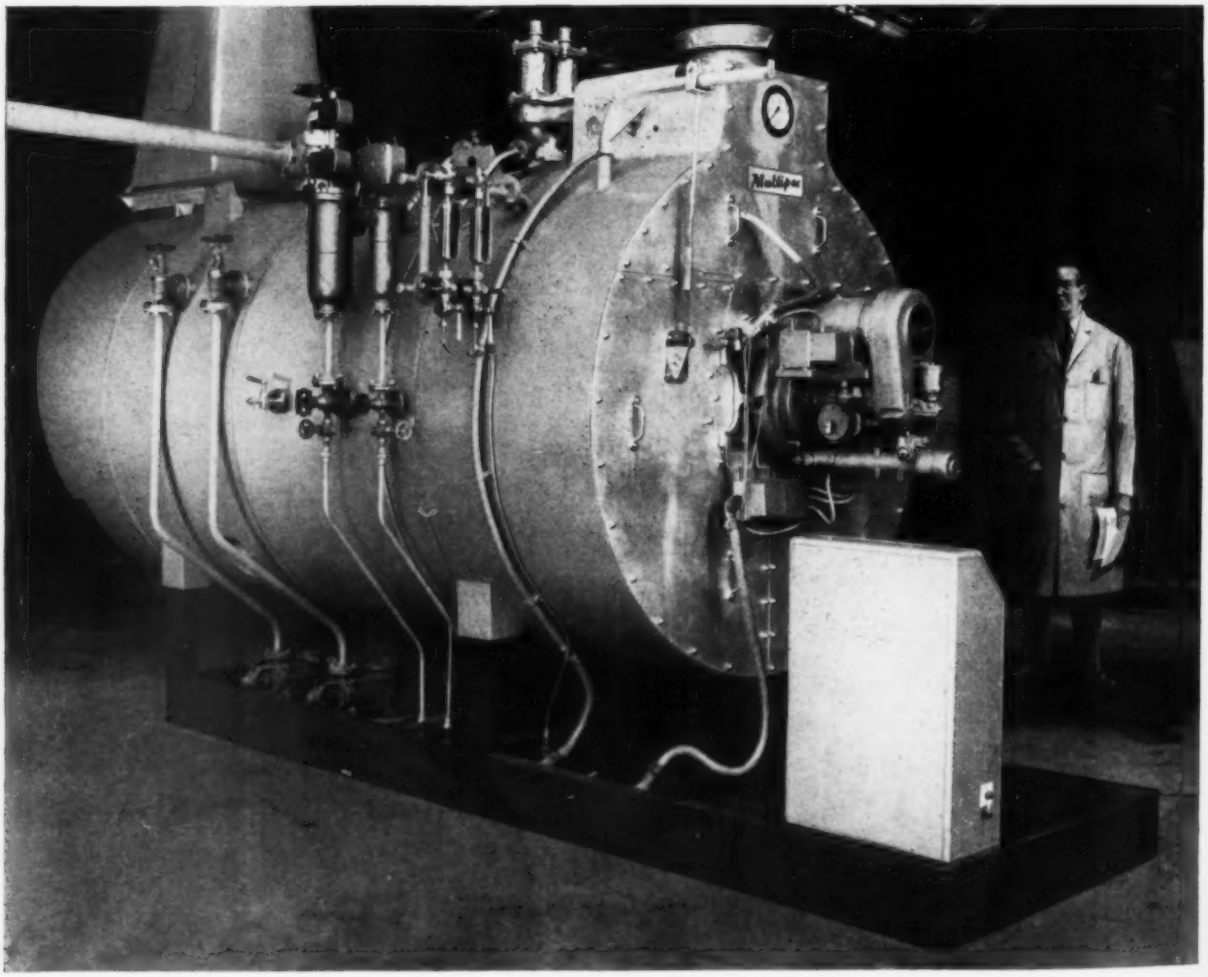


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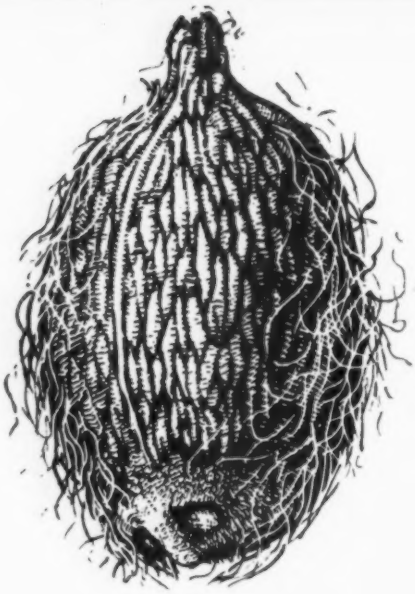

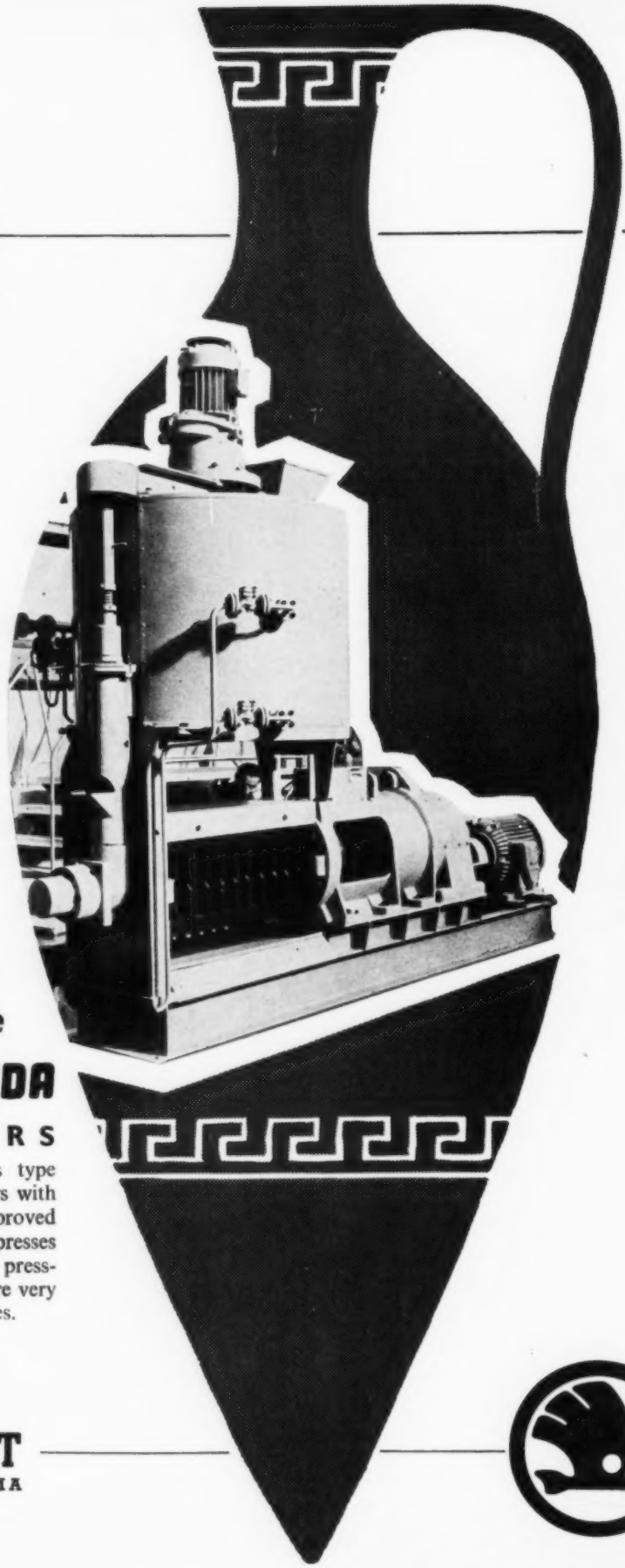

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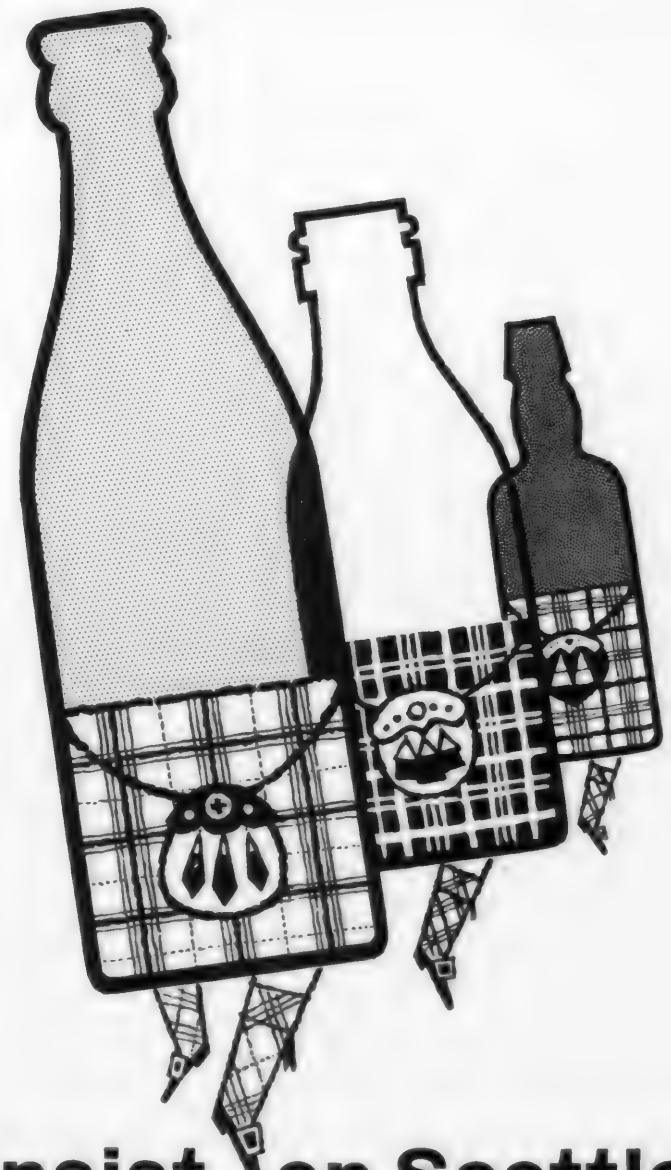

# I insist on Scottles!

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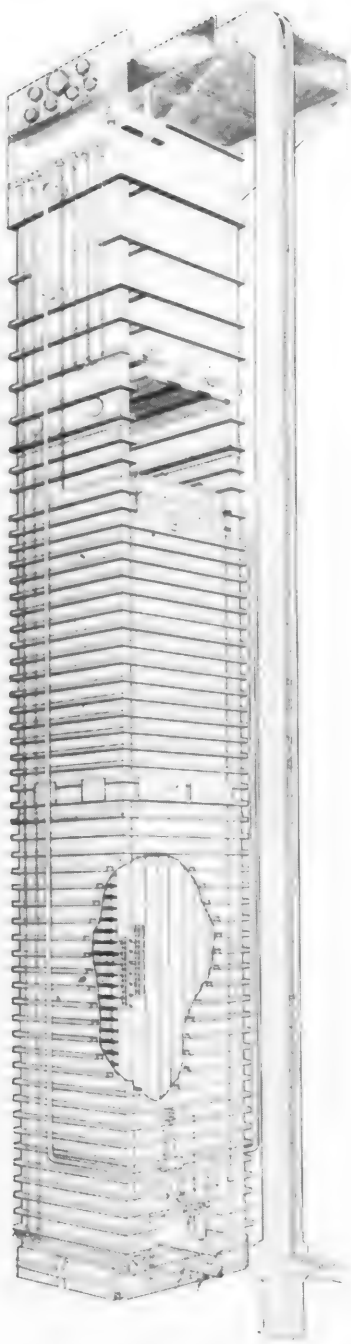

*These are its advantages:*

* **VERSATILITY** — Continuous sterilising of Vegetables, Meat Products, Fruits, Milk, etc., in cans, bottles or jars.
* **FLEXIBILITY** — Variable sterilisation temperature and time to suit each product.
* **SECURITY** — Throughout sterilisation and cooling, unit containers are totally enclosed in perforated steel carrier tubes. They cannot escape.
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* **RELIABILITY** — All moving and static parts are of great strength. All-welded chain of patented design with case hardened pins and bushes. No mechanical valves.
* **EASE OF MAINTENANCE.**—All moving parts readily accessible. Carrier tubes are not attached to the chains and are instantly removable for inspection.
* **EASE OF INSTALLATION** — The Carvallo Steriliser may be installed at floor level or in a pit according to circumstances.

There are over 50 Carvallo installations working in Europe alone.

*There is a Carvallo Steriliser to meet your requirements - let us know what those requirements are.*

Mather & Platt
LIMITED

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*London Office:*
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A55/1

# PLANNED DESIGN

## GIVES RECIPE CONTROL BY ONE MAN

At William Macdonald's Glengarry Biscuit Bakery, Glasgow, Baker Perkins have installed an automatic ingredients bulk storage and handling plant. One operator in the mixing room controls the mixing cycle for all dough production in the factory.

**MAIN CONTROL PANEL**
has simple relays—
yet is fully automatic. Once
set, needs no operator.

**MILLED SUGAR**
is continuously available from special 'ring main'. System is simple, safe, reliable.

**RECIPE CHANGE.**
Simple, small plug unit on control desk is interchangeable to alter mixing sequence.

**CAPACITY.**
Silos hold 140 tons of flour, 100 tons of sugar.

*MIXER CONTROL DESK. The operator simply presses one button. The mixing cycle is then automatic and the completion of each operation is indicated on the desk.*

## *Baker Perkins Ltd*

*Westwood Works, Peterborough*

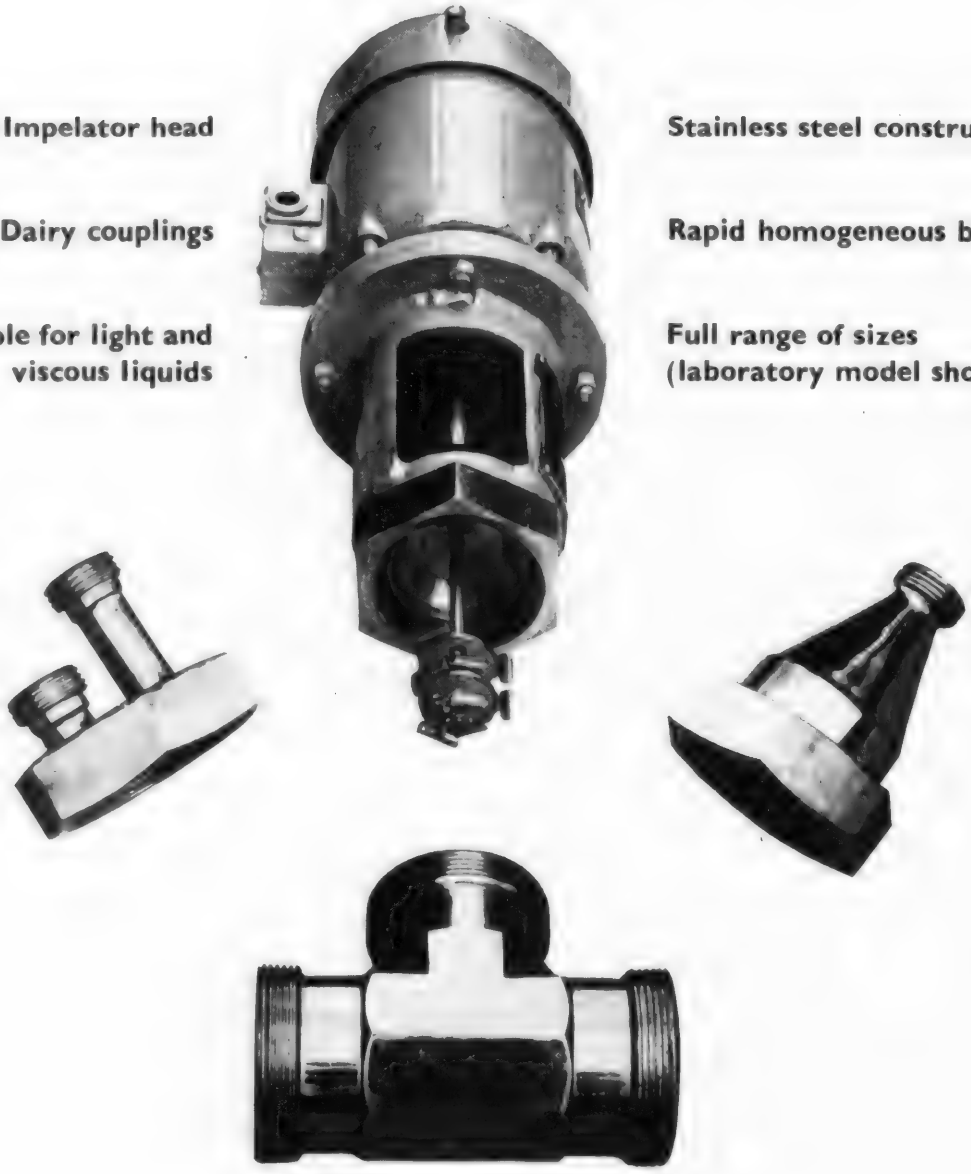
BP.B82B

# THE PLENTY EASICLEAN in-line-blender

Patent Impelator head

Dairy couplings

Suitable for light and viscous liquids



Stainless steel construction

Rapid homogeneous blending

Full range of sizes (laboratory model shown)

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**FILLERS THAT FILL**

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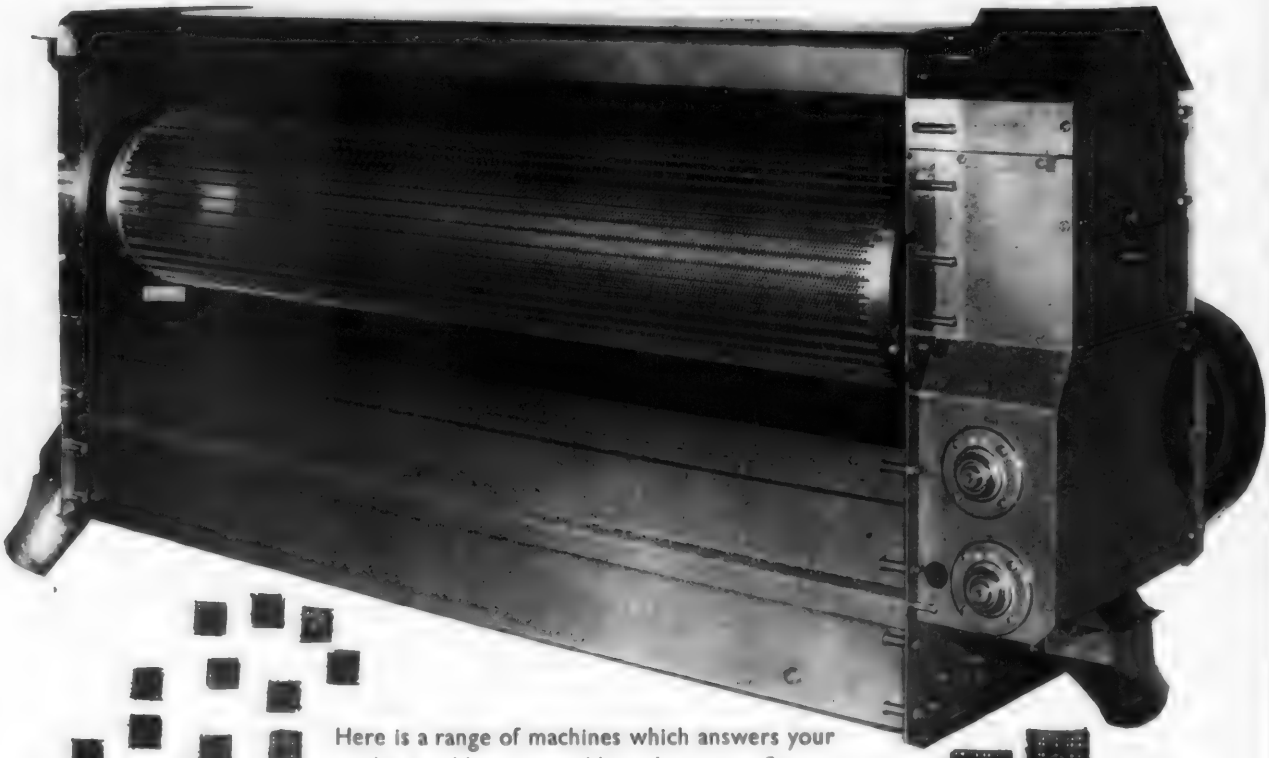
# Precisely the grader you need



Here is a range of machines which answers your grading problems as quickly as they arise. Simon-Carter Precision Graders accurately separate and size free-flowing granular materials of all varieties by thickness or width differences. They can be combined to give various flow arrangements in single, two- or three-high installations. Oversize and throughs can be fed directly from one unit to the next, eliminating special spouting and making the best possible use of limited height and floor space. Ask for details of the complete range.

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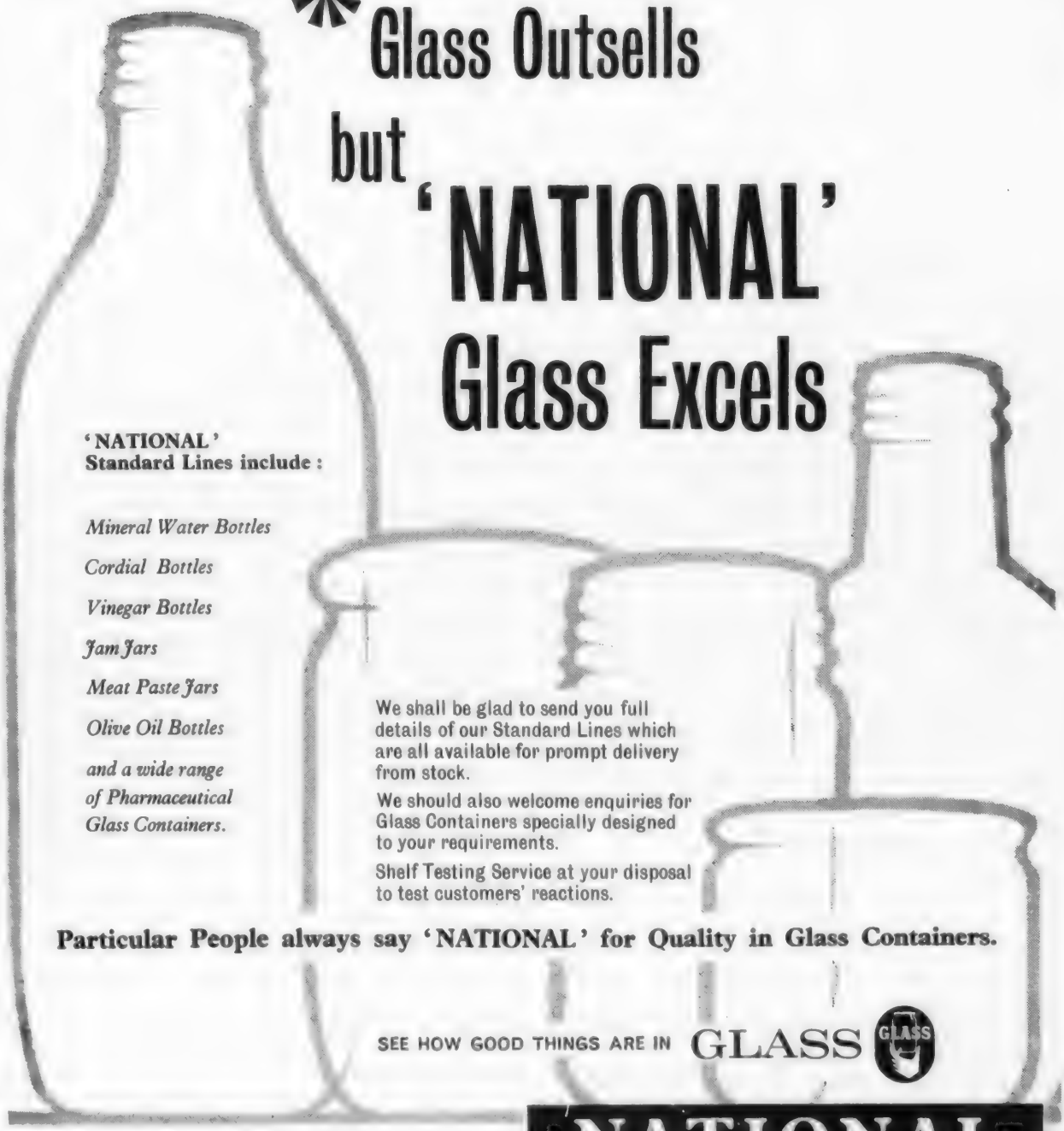

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*Cordial Bottles*
*Vinegar Bottles*
*Jam Jars*
*Meat Paste Jars*
*Olive Oil Bottles*
*and a wide range of Pharmaceutical Glass Containers.*

We shall be glad to send you full details of our Standard Lines which are all available for prompt delivery from stock.

We should also welcome enquiries for Glass Containers specially designed to your requirements.

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* *Independent Research at self-service stores has shown that when identical products are offered in Glass Containers and in an alternative pack side by side, Glass outsells the other.*
*May we send you full details of this most enlightening Research ?*

Regd Trade Mark

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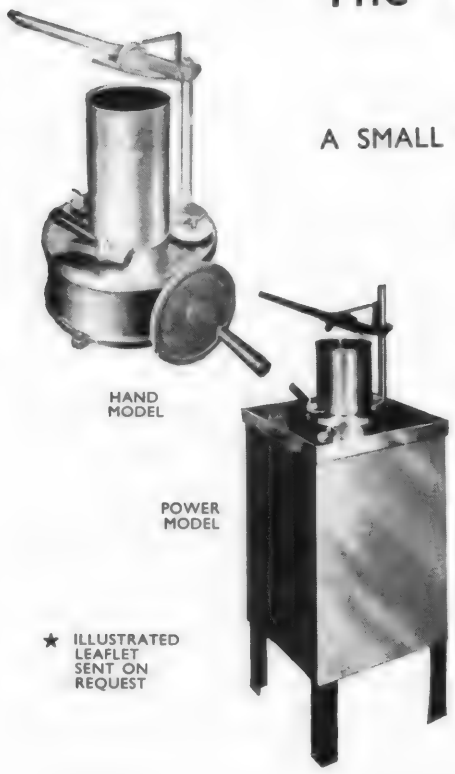
# CAN OPENER . . .

A SMALL MACHINE THAT SOLVES A BIG PROBLEM

***IT CLEANLY OPENS CANS IN SECONDS***
***LEAVING NO JAGGED EDGES or METALLIC SLIVERS***




★ ILLUSTRATED LEAFLET SENT ON REQUEST

It grips the can with a vice-like grip, cuts out the lid and removes it and any small slivers of metal by magnetism. A special attachment is available for removing the bottom of the can in preparation for baling.

Famous firms all over the world are using these very efficient and reliable can openers. Power and hand models are available and both will open cylindrical cans up to A.10 or 5 kilo size.

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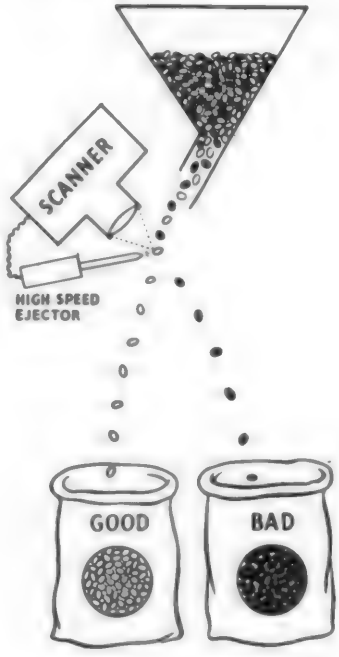


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**COLOUR SEPARATION**

*on a commercial scale*

**SORTEX separates by colour:**

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pulses
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ground nuts
locust beans
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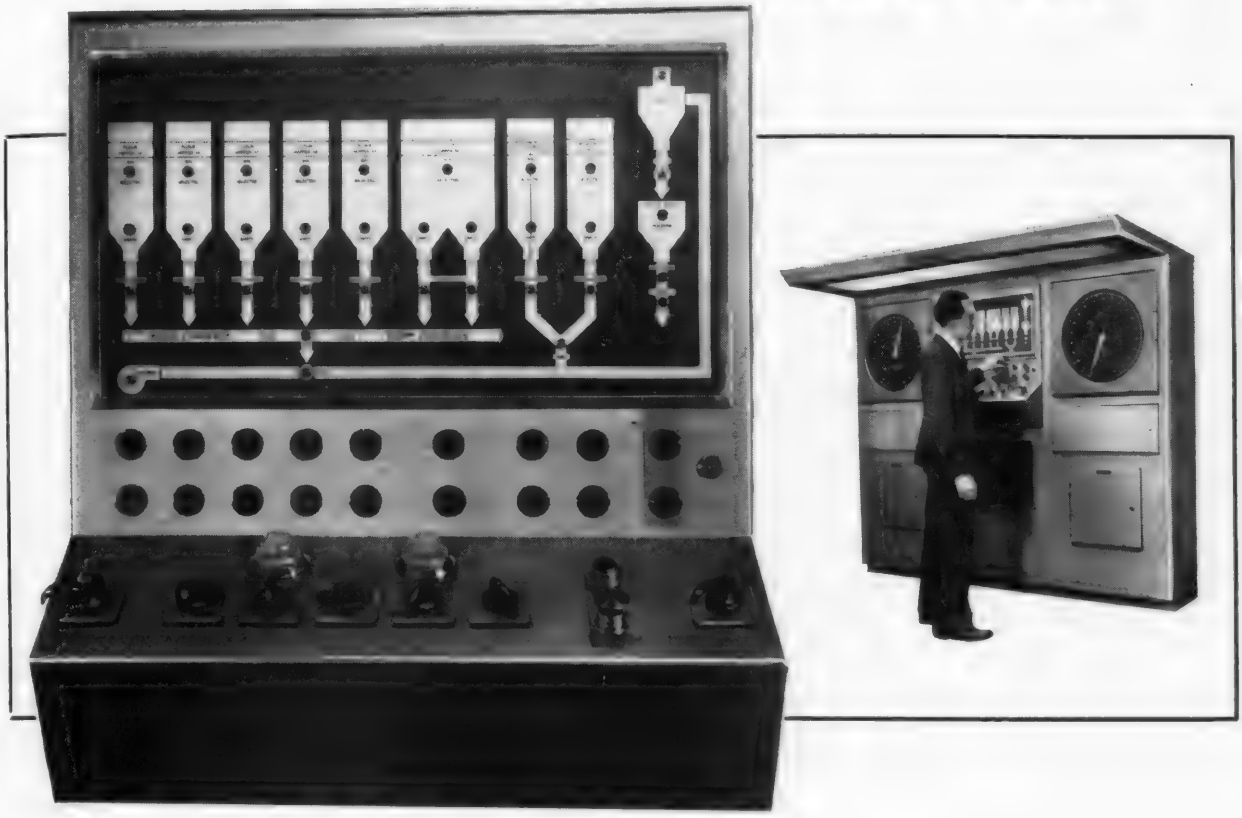

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This system gives simple, accurate control over the whole process. It eliminates errors, ensures that accurate records are kept, speeds up production, cuts costs. Here is yet another example of how leading food manufacturers are turning to the Elliott weighing system to give rapid and efficient plant operation.

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Industrial Weighing Division
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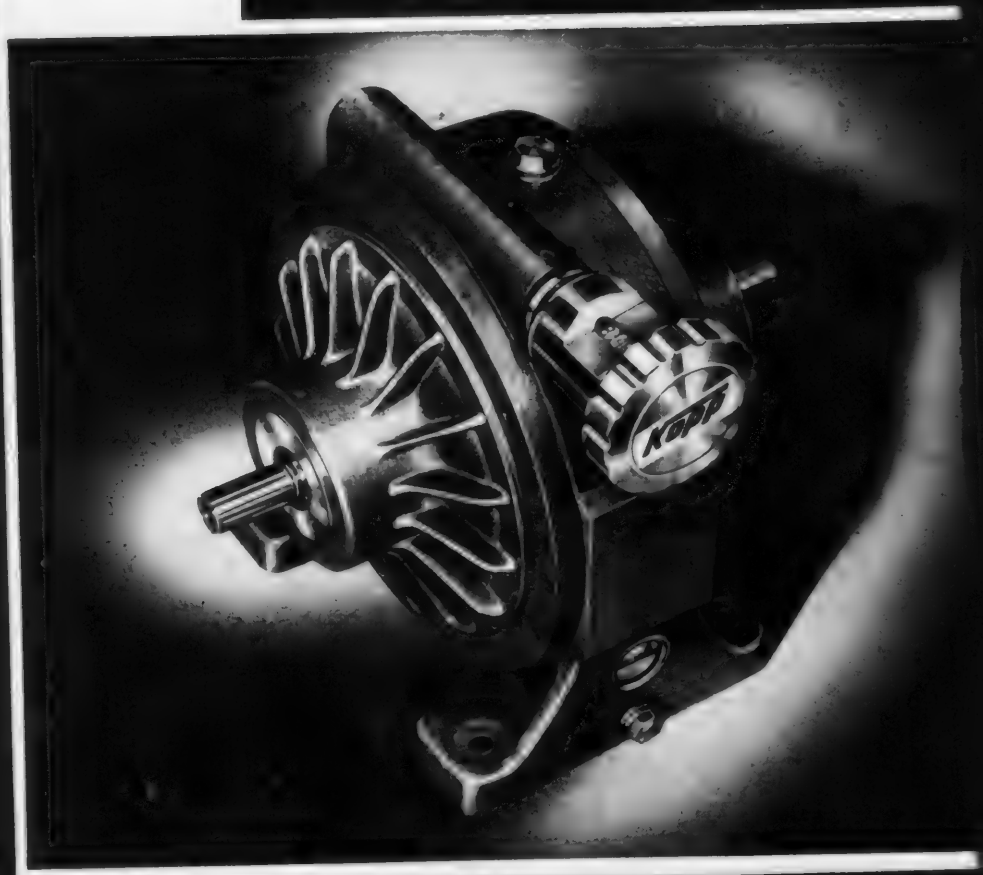


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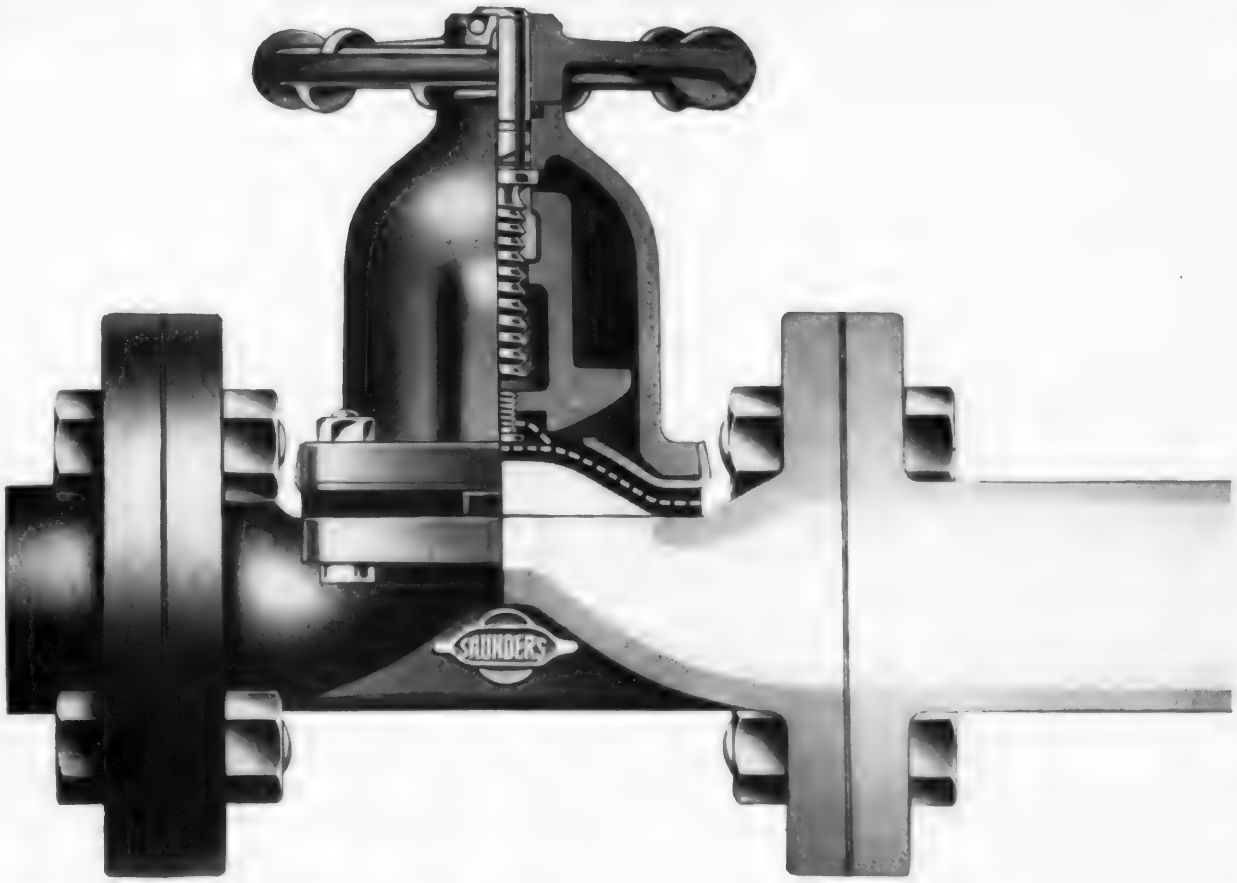


# DIFFERENT . . . to handle Vacuum as safely as Pressure

For Vacuum applications many factors have to be considered. There are Saunders Valves for use on most vacuum services and the Saunders Valve Research Panel is at the disposal of any enquirer with problems in this field.

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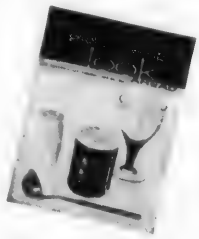
This simple attribute is really at the root of the Jackson service.
We want to know *where* a product is going to be sold; *who* is going to buy it; *what* is the competition. With this information we can really get down to providing a glass container that will sell your goods.
We don't claim to know better than your own marketing department, but we do know more about producing glass containers — what a wonderful team we would make together!

**Jackson packaging advisory service**
A comprehensive service embracing design and advice on glass containers, closures, labelling, display boxes and outers. This service also offers to manufacturers, packing in containers other than glass, free market research facilities on 'design preference testing', 'container-in-use testing' and 'shelf testing', as well as an area test marketing service at a nominal charge.
Ring Museum 7263 with any problem you may have or write for informative booklet.

**Jackson research unit**
A team of experts, perfecting new types of glass packs and closures.
If you have a new product or want to give a new look to an existing one, we may already have the answer for you.

*If your company is concerned with packing and you do not regularly receive a copy of the Jackson Glass Journal 'Look Ahead' please write so that we can put you on our mailing list.*



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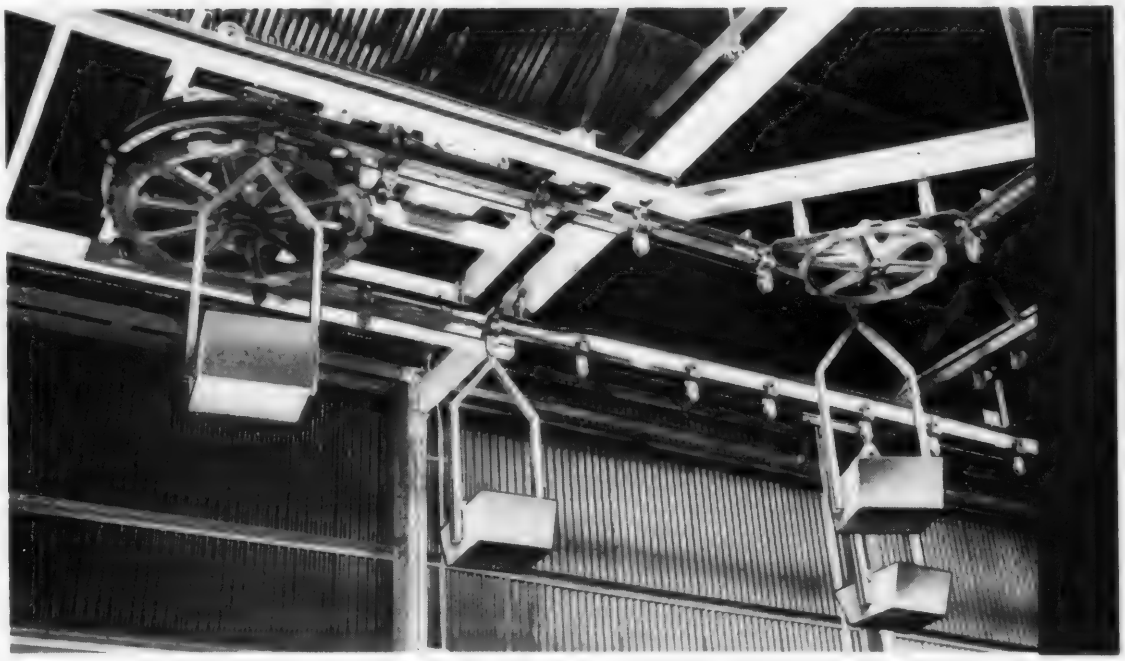
## OVERHEAD WIRE ROPE CONVEYORS

*(segmented NOT continuous rope)*



The smooth and efficient running of the FE-LINE Overhead Conveyor gives you a system of greater flexibility combined with simplicity. The FE-LINE has a minimum of wearing parts and "Sealed for life" bearings. Can be used where the most stringent cleanliness has to be observed i.e. Food factories and Bottling plants, Dairies and Bakeries. For operation, lubrication is confined to a minimum. Power requirements are low and operation is smooth, clean and quiet. Let us solve your handling problems, please write or telephone.

**• Easily installed. • Little maintenance required. • Capacity 10-600 lbs.**

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**OVERHEAD WIRE ROPE CONVEYORS**

**CONVEYOR AND SHOTBLAST LIMITED**

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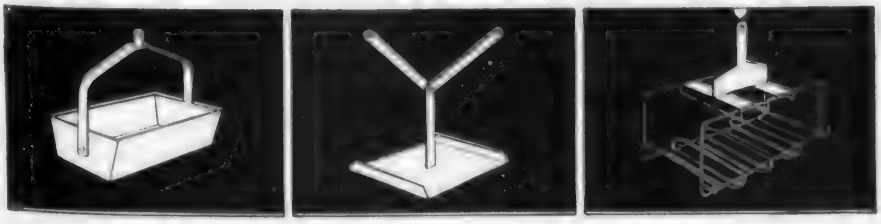

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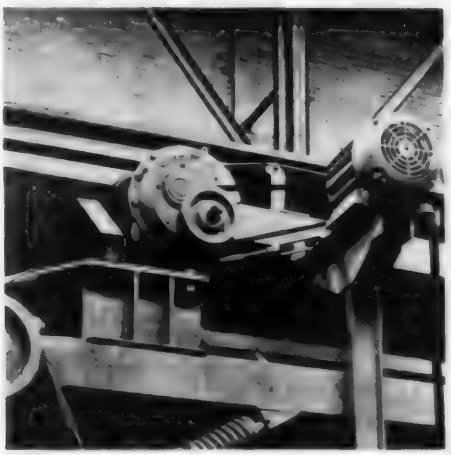

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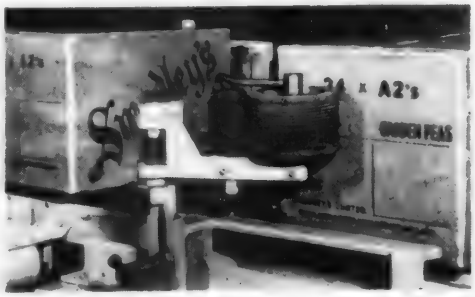

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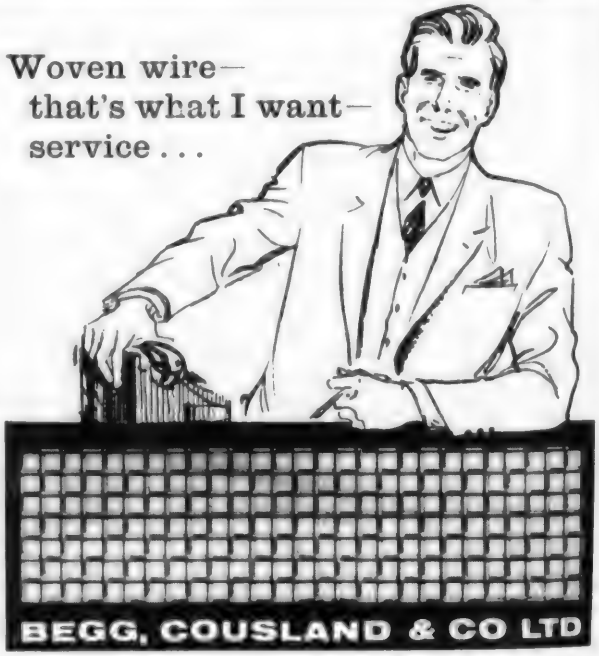

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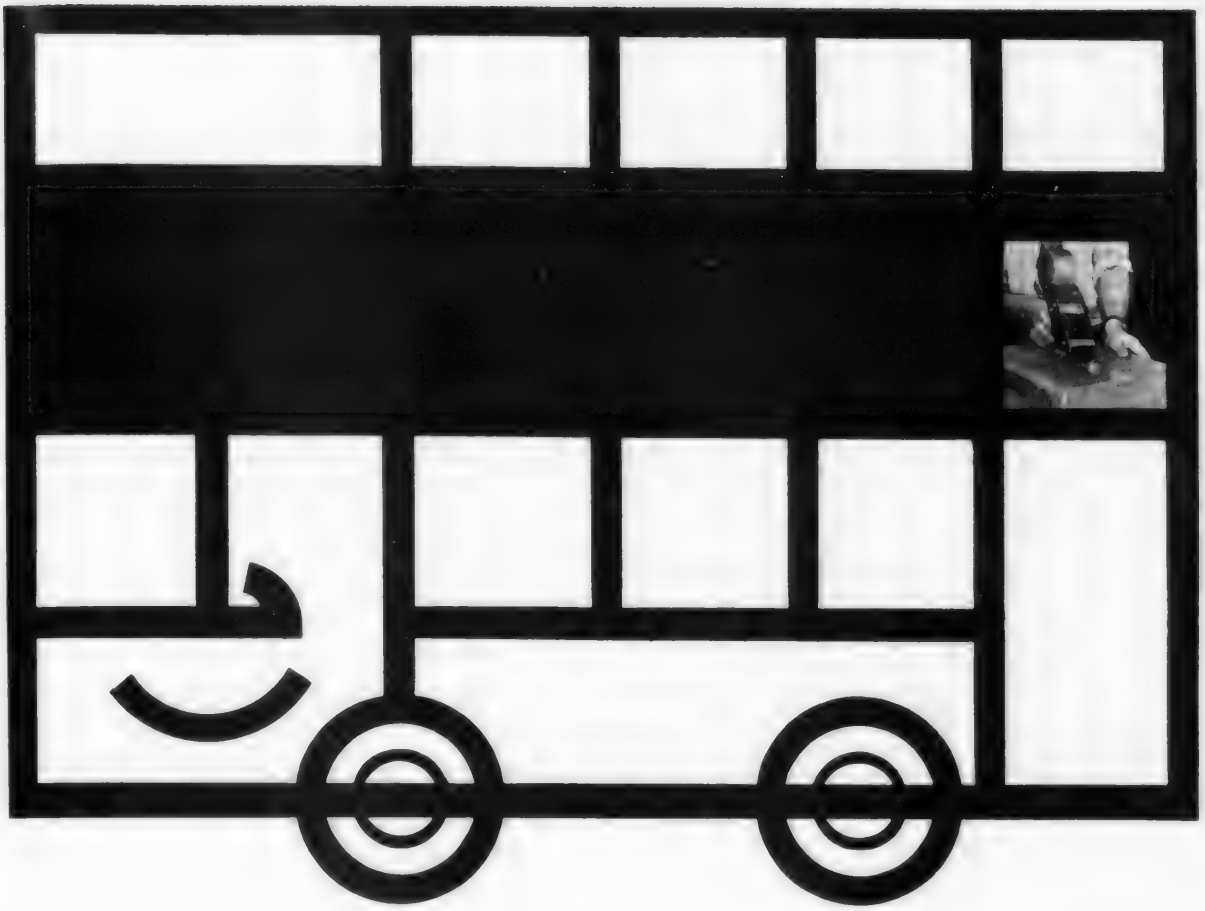

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THE Security THERMOSTATIC MIXING VALVE

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SILENT
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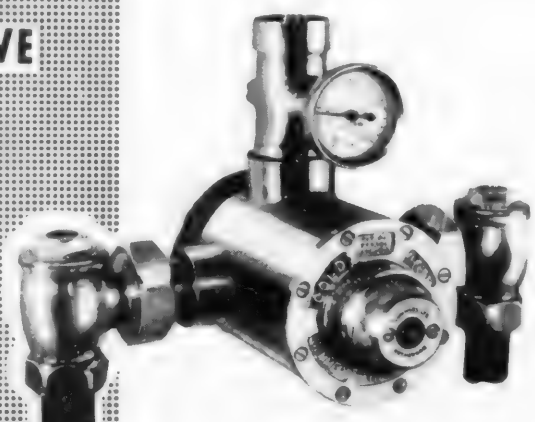

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Multiple bi-metal element coils located in the main flow of the valve react immediately to temperature variation and give smooth positive action ensuring complete control in maintaining a uniform supply of water at the requisite temperature.

FM 65

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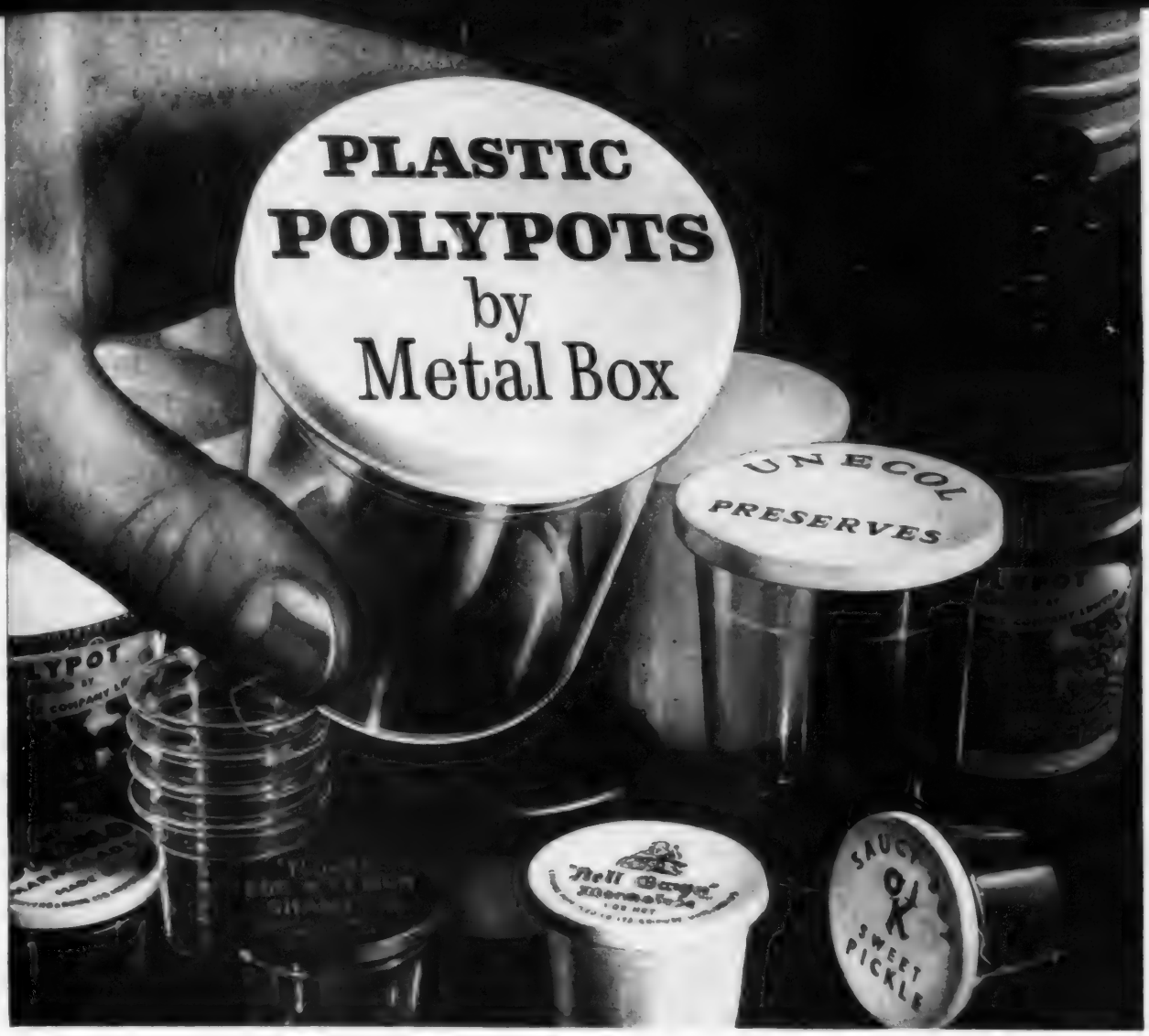
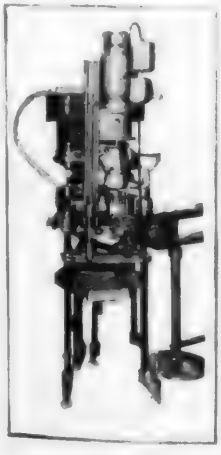



Polypots are made of polystyrene; they are well designed, light, tough and splinter-proof. Moulded either clear, or in a variety of brilliant colours, their attractive appearance can be enhanced by Metal Box colour printing on both the pots and the snap-on polythene caps which provide hygienic protection for the contents. Metal Garda caps and paper caps can also be supplied.

*For more information write or phone to:*



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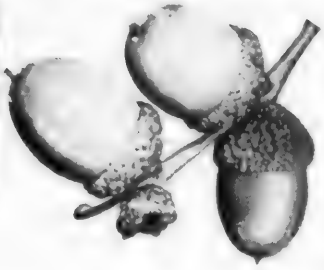

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We invite you to make use of our long and unique experience in the spicing of foods. You are most welcome to visit our food development laboratory in London where we are constantly developing new formulae for the more attractive spicing of foods.

**SPICE ESSENTIAL OILS**
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**SAROMEX SPICES**
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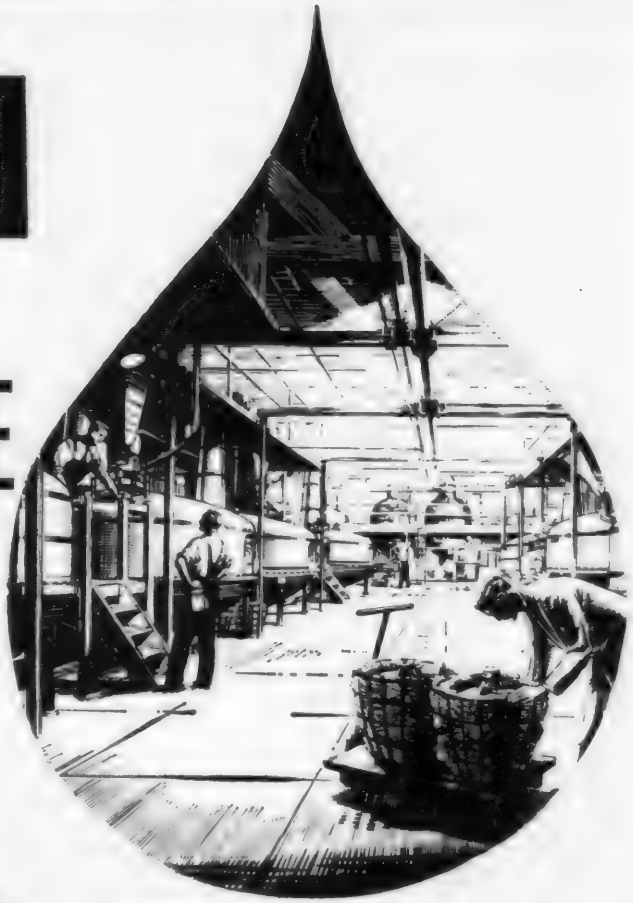
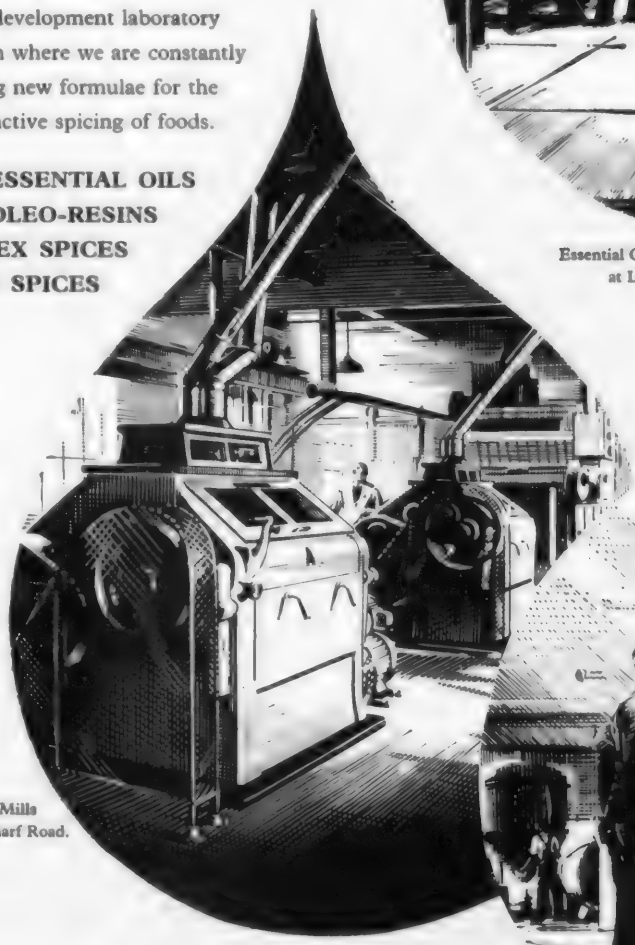
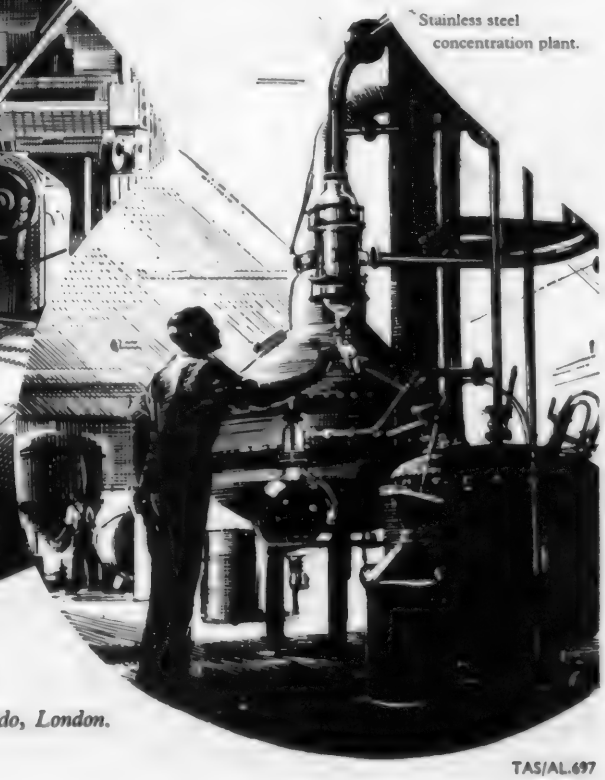


Essential Oil Stills at Long Melford.



Pepper Mills at Wharf Road.



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TAS/AL.697

# Plastic packaging by METAL BOX

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PLASTICS GROUP

PLASTIC FILMS · LAMINATIONS · BOTTLES · MOULDED CONTAINERS

THE PLASTICS GROUP OF THE METAL BOX COMPANY LIMITED · 37 BAKER STREET · LONDON W.1 · HUNTER 557

BIRDS AND BEASTS—BOTTLED BY UNITED GLASS

# *The Glastodon*

EATING HABITS: omnivorous (nothing disagrees with glass).
COLOURING: various (flint, pale, green, amber, blue, opal).
HABITAT: United Glass — the place to go for the best glass packaging service:

- The finest in modern glass package design and research.
- Containers and closures made together to suit each other perfectly.
- Expert help and advice on any glass packaging problem.
- The right type of container for every kind of product.

*Glass makes the finest containers of all — and United Glass makes them by the million. Come and see how we can help you.*

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# MALT PRODUCTS

A THOUGHT FOR FOODS

Protein additions?

Vitamin B complex?

Starch conversion?

Fermentation balance?

Flavour development?

Laboratory media?

GIVE US FOOD FOR THOUGHT!

MUNTON & FISON LIMITED

CEDARS FACTORY · STOWMARKET · SUFFOLK

*Maltsters for more than a Century*

This bottle carries a message, from Viscose to you and ultimately from you to the consumer.

In the struggle for sales, Viskring cellulose bottle closures are a first-class weapon. Bright, colourful, they catch the eye of the purchaser.

In addition to basic colour, Viskring can be printed with colourful designs or trade-marks, or with your own sales message! And of course they engender confidence — by being hygienic, by ensuring full measure (no loss by evaporation) by discouraging pilfering, and above all by preventing stoppers riding or blowing. Viskrings come in all sizes, are easy to fit and stay securely in place.

- **Easy to fit, self adjusting**
- **Prevent stoppers riding or blowing**
- **Secure screw caps**
- **Hygienic** ● **Non-inflammable**
- **Eye-catching** ● **Discourage pilfering**

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VC 21

# Versatility

## BEER IN CANS... another new use for tinplate

Tinplate is changing the traditionally conservative habits of beer-drinkers. Already in Britain leading brewers are packing no fewer than one hundred and eighteen brands of beer in cans.

Research and development by The Steel Company of Wales have helped to make possible this further example of tinplate's increasing versatility. In addition to the special type of tinplate required for canning beer, The Steel Company of Wales produces a wide variety of grades and qualities to suit many specialized applications.

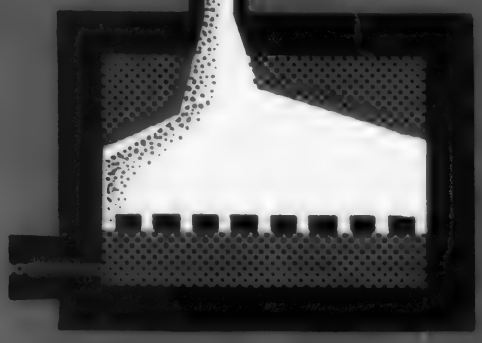
We make a great deal of Britain's tinplate, and we are constantly learning something new about it. There are several interesting recent developments. Why not write to us?

## TINPLATE DIVISION

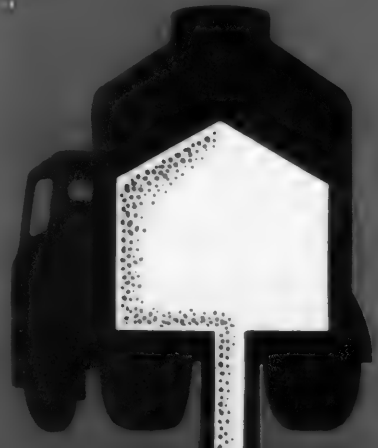
## THE STEEL COMPANY OF WALES LIMITED

Carmarthen Road, Swansea, Glamorgan Telephone : Swansea 51571 Telegrams : Welshplate, Swansea

# GIVEN A 4" PIPE



. . . one of I.C.I.'s air discharge vehicles can pump seven tons of Pure Dried Vacuum Salt *direct* into your saturator — even though it may be on the top floor or tucked away at the back of your works. The entire operation takes *about 30 minutes*, all it costs you is the installation of a length of 4"-bore pipe — and it *saves* you packaging costs, handling costs and any risk of contamination.



Send for free copies of the booklet "Salt by Pipeline"
IMPERIAL CHEMICAL INDUSTRIES LTD.,
LONDON, S.W.1

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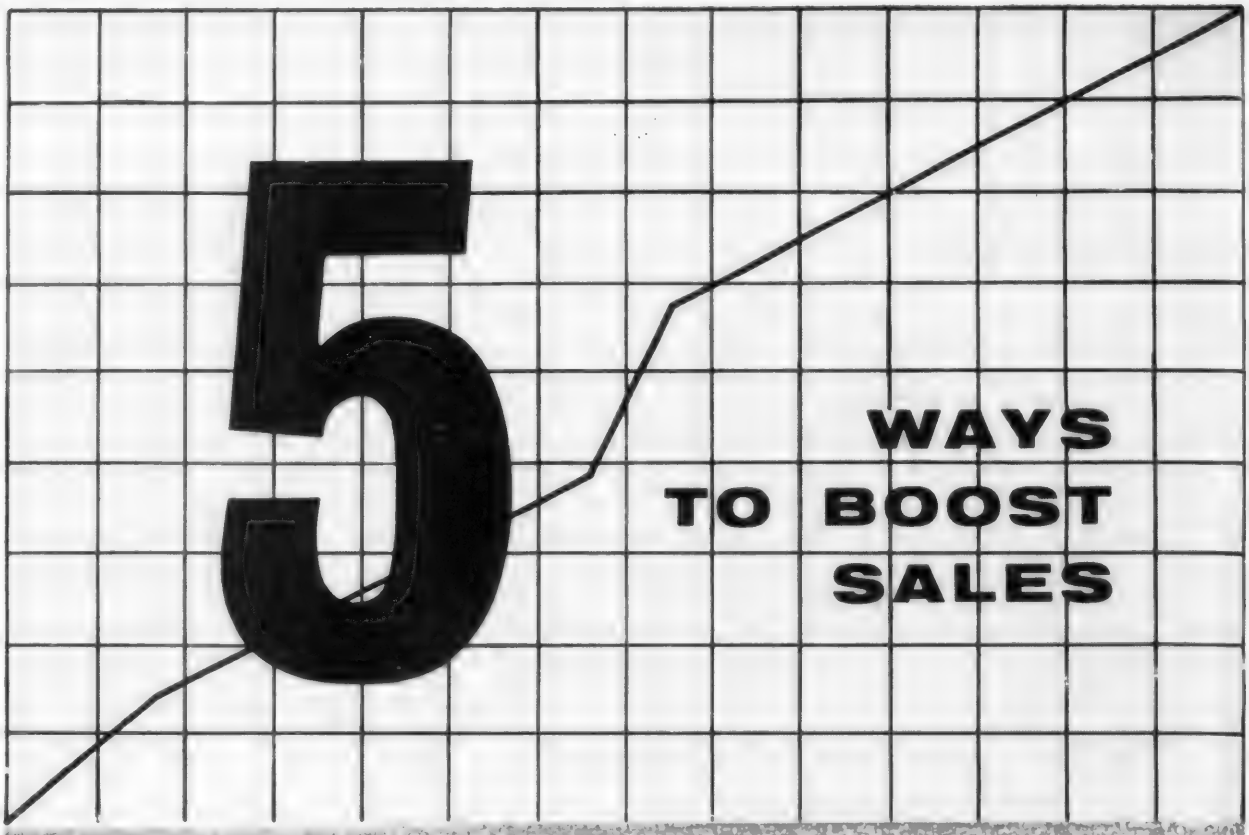


**1** REIGATE Brand **NUT FLAVOURS**
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**2** REIGATE Brand **VANILLA FLAVOURS**
—for all purposes. Highest grades from Bourbon Beans and also compounded flavours of quality.

**3** REIGATE Brand **BUTTER FLAVOUR NATURA**
Gives that quality touch and real "Butter taste" to your products.

**4** REIGATE Brand **SOLUBLE OIL OF RHUM**
Pure distilled oil with the same flavouring constituents as the finest Jamaica Rum. Free from alcohol, artificial preservative and colouring matter.

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Types for all purposes.

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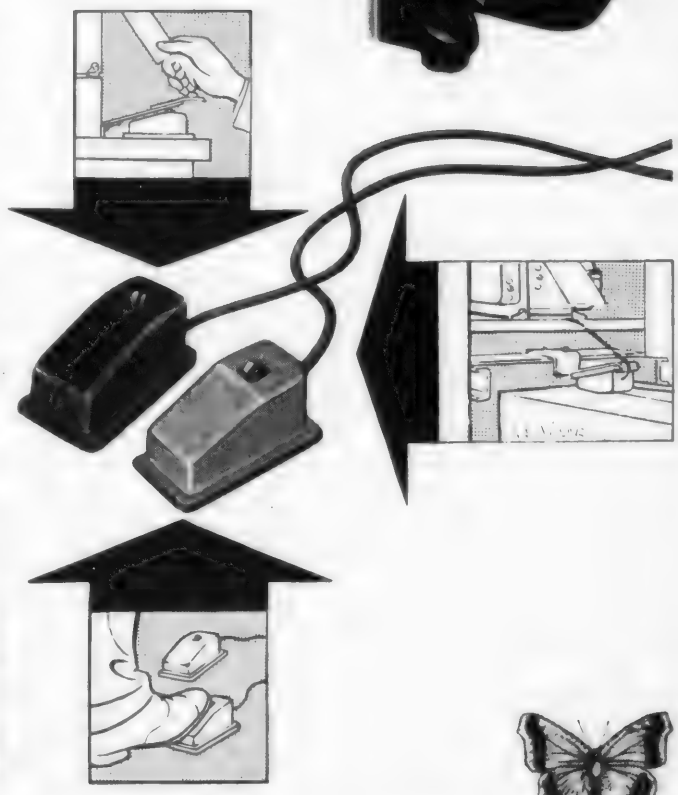
A *feather-light* touch of the button . . . and Gumstrip Sealing Tape (Regd.) is moistened . . . cut and delivered. Operation is optionally by foot . . . leaving both hands free for packing. The high-speed Electric Tapeshooter makes work in your despatch department, lighter, quicker, more economical. Special features include ample water reservoir, water heater for quicker adhesion, 4″ to 50″ length control. May we arrange a demonstration on your premises? Test this machine for 7 days *without* obligation.



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# let IMC solve your fi

If you have a filling problem in your plant, whether it be for solid packs with brine, syrup, oil or other liquids, or the more complicated filling of paste or mixed foods, IMC has the answer for you. Here is shown a typical high speed IMC 520 Pea and Bean Filler featuring unsurpassed accuracy of both product and liquid fill. Speeds up to 350 cans per minute are being realized in installations throughout the world

The insert shows the FMC-IMC 20 Pocket M & S Piston Filler for viscous products. It is capable of speeds up to 600 cans per minute depending on product and can size.

IMC-FMC Fillers, manufactured in Europe under rigid standards long proven and adopted by canners throughout the world, offer you these advantages :

**LABOR SAVINGS :** When close-coupled to closing machine, one man operates both machines.

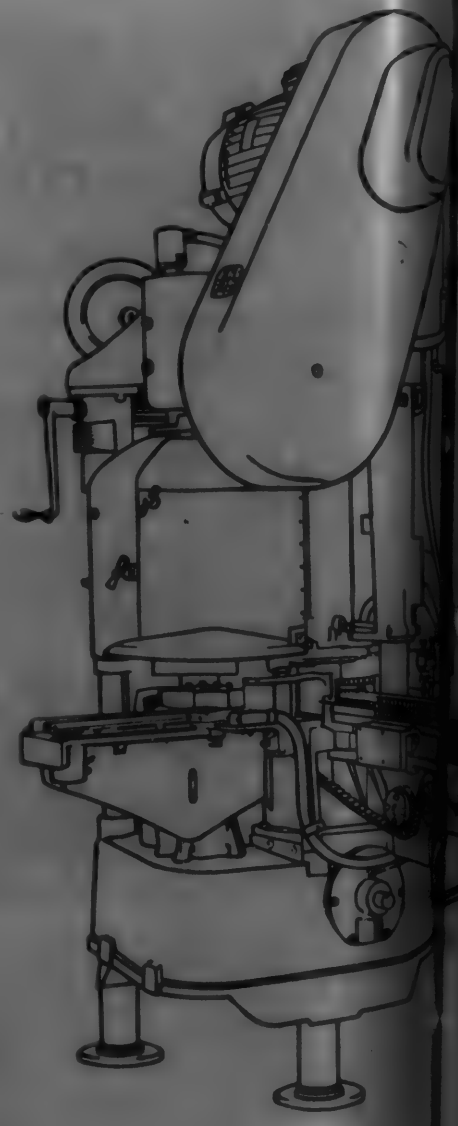
**ELIMINATES WASTE :** Automatic No-Can, No-Fill device on both product and liquid sections.

**ACCURACY OF FILL :** Provides greatest accuracy on widest range of products of any fillers available today. Volume of fill is readily adjustable on all IMC Fillers

**LONG LIFE :** IMC Fillers are built to highest standards of materials and workmanship assuring years of dependable operation with minimum of maintenance

**RAPID CHANGE-OVER :** Change from one size to another is accomplished quickly and easily within the range of the machine.

*IMC-FMC equipment is the most widely used food processing equipment in the world. It is now built in Europe and readily available to meet your specific needs.*



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PALMER

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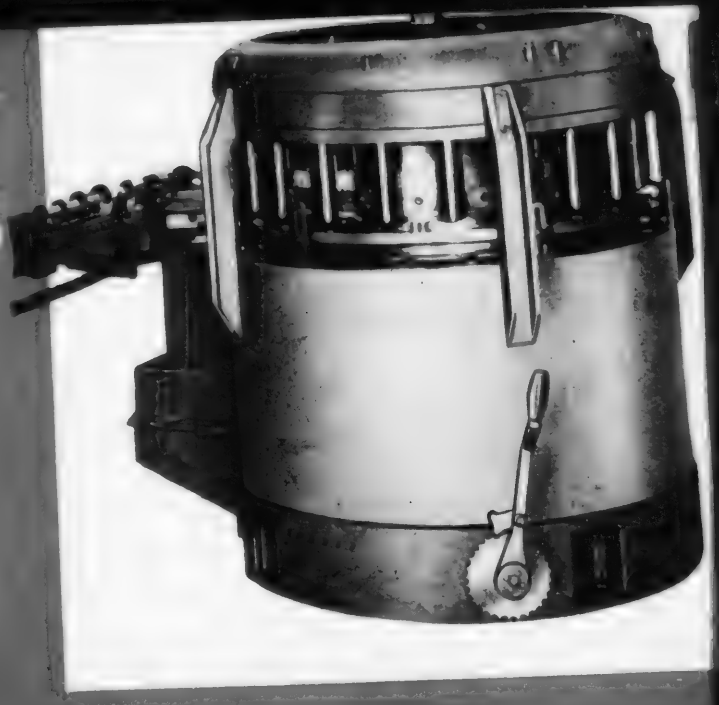

ACY CORPORATION

Contact your IMC FMC Representative today for his help in solving your FILLING PROBLEMS.

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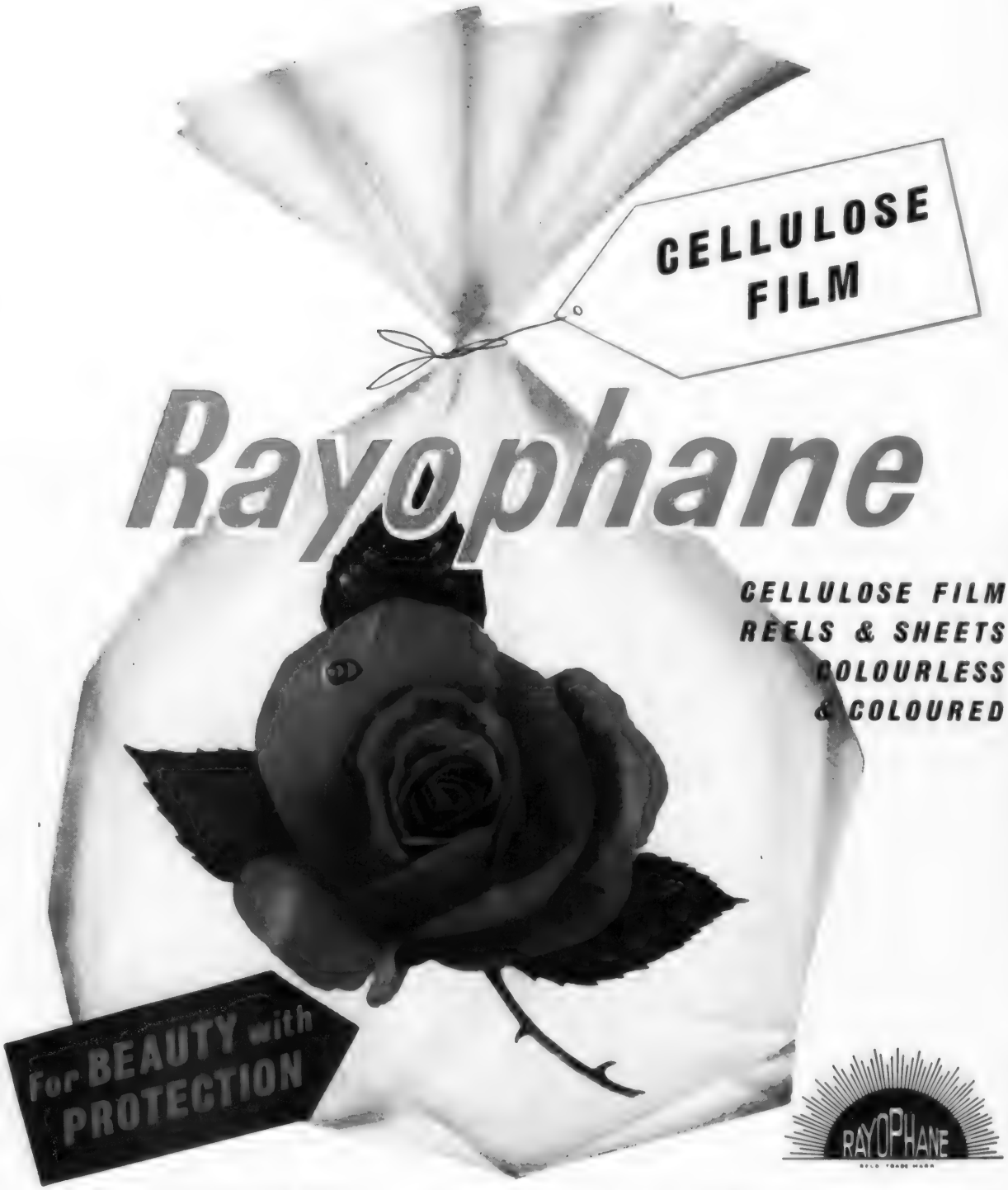
Keep it
food equipment

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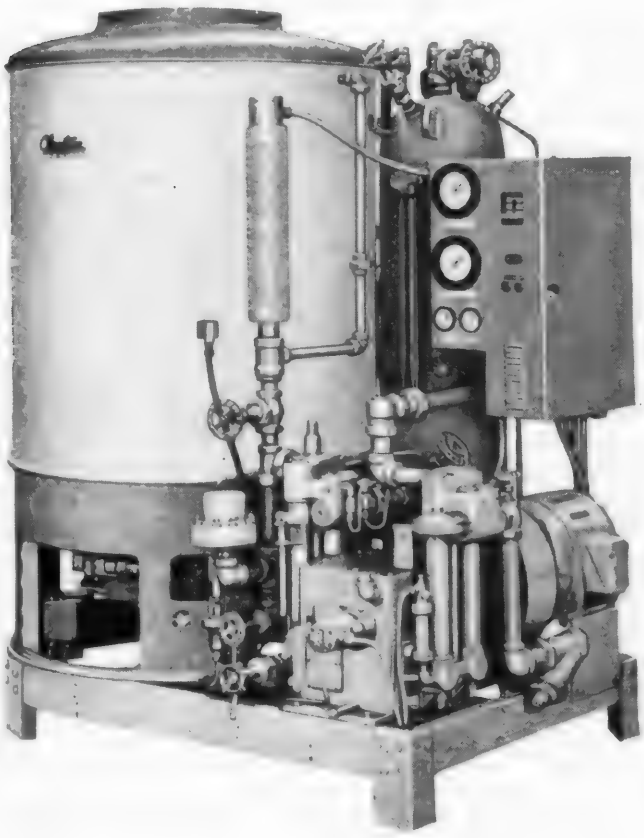
Clayton

# Fully automatic oil-fired STEAM GENERATORS

## give *steam instantaneously*

for heating, processing and other auxiliary services with:—



- ★ reduced fuel costs
- ★ immediate automatic operation from manual cold start
- ★ full operating pressure reached in less than five minutes from cold start
- ★ automatic adjustment to steam requirements
- ★ safety, minimum maintenance and easy to service
- ★ spares and service throughout the world

Clayton Steam Generators are available with capacities ranging from 429 lb/hr. to 4600 lb/hr. and can be supplied for firing by fuel oil of 220 or 950 secs. viscosity (Redwood No. 1).

*TECHNICAL PUBLICATION AVAILABLE ON REQUEST*

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Telephone: Newton-le-Willows 3641

*Member of The English Electric Group of Companies.*

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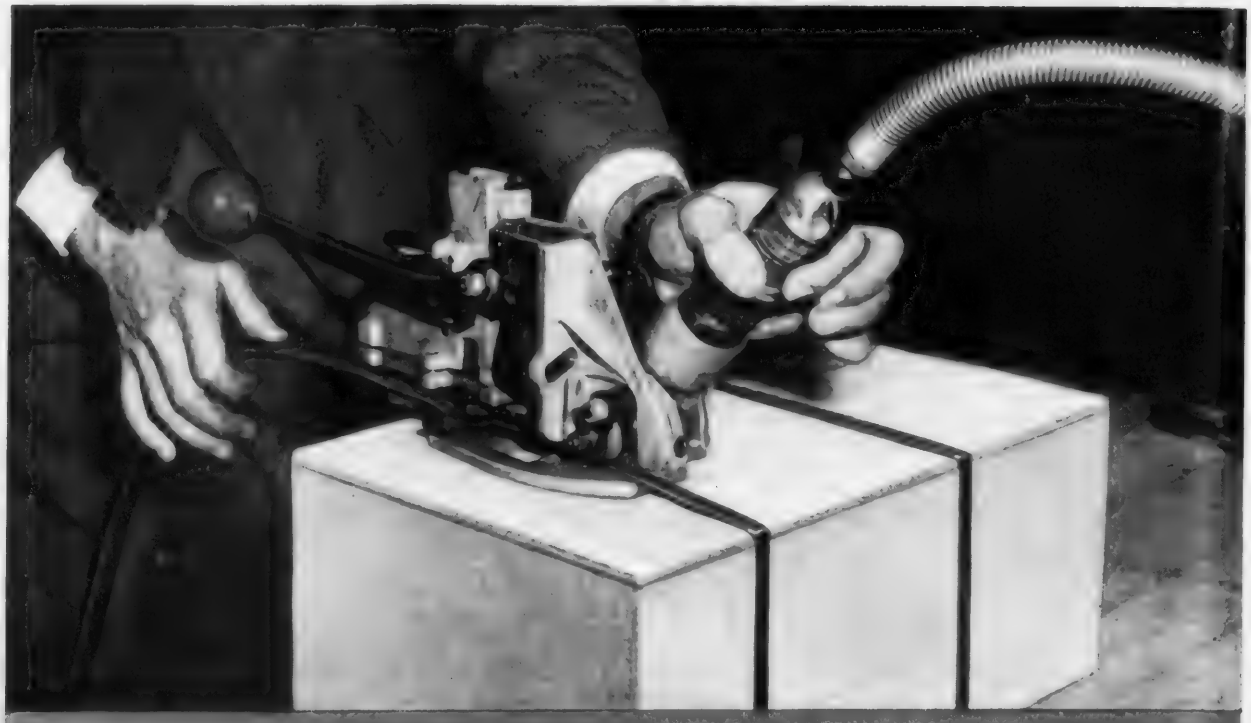

# BUNDLE...BOX...BALE

## *If you tie your shipments...*
## *here are 12 pointers to superior results at less cost*

**1** Steel strapping is strong. Even our smallest size has a tensile strength of over 400 pounds; our largest, over 15,000 pounds. This strength is unaffected by age, heat, cold, moisture, or dryness.

**2** And it is low in cost. For equal lengths of equal strength, we haven't found anything that costs less than steel.

**3** Tension is what binds your load together, or reinforces your package. You can pull high tension with steel strapping, and it holds without stretching.

**4** Signode steel strapping is a quality product, carefully made and constantly improved to do its job better. It is available from Signode in a wide range of sizes.

**5** Because it is well made, Signode steel strapping is smooth, pleasant and safe to handle.

**6** It is firm and straight, easy to put on square, without kinks, twists, or tangles.

**7** It is flexible enough to loop easily around a package or bundle and to pull tight around corners.

**8** It is joined by a visible, inspectable mechanical seal that is dependable in spite of dirt, moisture, or oil.

**9** It cannot be slipped on and off your package, bundle or bale . . . prevents pilferage.

**10** It can be applied at any desired speed, without waste, with fast Signode hand tools, power tools, and automatic machines.

**11** Signode men train your operators, keep Signode tools in good order, suggest ways to reduce your cost and improve your results. Signode has specialized in steel strapping for over 45 years.

**12** There is a Signode manufacturing plant in South Wales, with its own sources of steel, to assure you of the steel strapping you need, even in times of shortage.

* *First in Steel Strapping!*

**SIGNODE ties everything together!**

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# WHAT MAKES THESE BEST-SELLERS?

Shippam's Potted Salmon with Butter and Dressed Crab with Butter are two of a range of Minced Foods which have proved so successful that they easily outsell their nearest competitors. (In fact Shippam's Potted Salmon with Butter outsells its nearest rival by more than two to one!) We asked Shippam's to tell us why they are so popular.

"Undoubtedly their success has been due to two things," they say. "First, the quality of the salmon and the crab; secondly, the inclusion of the word 'butter' in the title. This latter point has made a great impression on the trade and the housewife."

Like Shippam's, many other manufacturers are coming to realise the extra selling power of 'butter' products. They realise that today's housewives are more than willing to pay a little extra for something that promises more quality, more deliciousness, because it's made with butter. So if up to now you have hesitated to use butter in your products, think again. It *pays* to use butter, and to say so.

ISSUED BY THE BUTTER INFORMATION COUNCIL, Mercury House, Waterloo Road, London S.E.1 *Telephone:* WATerloo 5231

# Suet starts life on TURNERS WHITE

## FOOD CONVEYOR BELTING

The smooth white surface of Turners Food Belting will increase your handling efficiency. Easily cleaned, it will not contaminate the food and there will be no wastage of valuable material. The photograph below shows the intake plant at the Atora Works of Hugon & Co. Ltd., handling large lumps of raw fatty material used in the manufacture of beef suet. Give your products a good start in life on Turners Food Conveyor Belting. *We shall be pleased to send details on request.*

*White finished Conveyor Beltings installed by the East Lancashire Conveyor Company at the Atora Works of Hugon & Co. Ltd., Manchester.*

**TURNERS**

**FOOD CONVEYOR BELTING**

Reg.

THE MARK OF BETTER BELTING

**TURNER BROTHERS ASBESTOS CO. LTD • ROCHDALE • ENGLAND**

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Natural & Synthetic Vitamin A
Vitamin $B_1$ (Aneurine Hydrochloride B.P.)
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# *Why* FILTRATION = NYLON

Today, more filtering with nylon cloth is carried out in Britain than anywhere else in the world. But if you operate a filtration process and do not already use nylon, you may like to know some of the reasons why nylon cloths so quickly established themselves:—

**LONG LIFE**—Nylon filter cloths have much greater life expectancy because of nylon's excellent tensile and rupture strength, wet and dry; its superb abrasion resistance; its resistance to chemical attack and extremes of temperature, and its immunity to attack by mildew and fungi.

**ADAPTABILITY**—Nylon cloths are supplied in all weights and weaves. There is a choice of surface characteristics, including smooth surfaced cloths for easy cake discharge.

**BETTER SERVICE**—Nylon cloths have excellent filtering properties, do not shed surface fibre. They can be cleaned quickly and easily. Cloth stability is very good.

**LOWER COSTS**—All the advantages listed above mean that nylon filter cloths can give you a substantial cut in costs. By making filtration processes simpler, they can increase production.

## IT'S *Nylon* FOR STRENGTH

BRITISH NYLON SPINNERS LIMITED, PONTYPOOL, MON

B Nylon S

*WE ARE OFTEN IN HOT WATER*

# BUT NEVER

*IN RESPECT OF THE QUALITY OF OUR*

# FOODSTUFF COLOURS

Available in all shades, for all food products and for world markets. Why not drop us a line if you are interested?

**Williams HOUNSLOW Ltd.**

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*MANUFACTURERS OF GUARANTEED COLOURS FOR THE FOOD INDUSTRY FOR MORE THAN EIGHTY YEARS*

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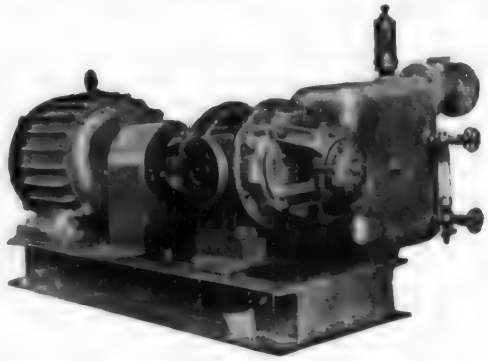
## ONLY CLEAN AIR CAN REACH YOUR PRODUCT FROM THIS PUMP!

# 'NASH HYTOR' CLEAN AIR COMPRESSOR

Regd. Trade Mark

**IT'S THE SCRUBBING ACTION OF THE LIQUID SEAL AND ENTIRE ABSENCE OF INTERNAL LUBRICATION**

*NO FILTERS OR AFTER COOLERS*



*ONE MOVING PART NO METALLIC CONTACT*

*British Made*

**By NASH ENGINEERING CO. (Great Britain) LTD.**

*Further details with pleasure from Sole Agents and Service Engineers for BRITISH ISLES*

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# *Long run or short, it will serve you well!*

*Special bodywork by Normand Ltd.*

# KARRIER 'BANTAM'

## *2 - 3 TONNER Petrol or Diesel*

THIS POPULAR, versatile and extremely manoeuvrable forward-control vehicle is adaptable either as a van, lorry or tipper. Light, strong and well proportioned, its wide-vision cab provides exceptional driving comfort, whilst at the same time its low-cost running and maintenance make it a most practical and profitable investment.

Alternative wheelbase models are available, tyred for either long distance runs or shorter localised journeys.

*Full details from your local Karrier dealer.*

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**BACKED BY ROOTES COUNTRY-WIDE PARTS AND SERVICE ORGANISATION**

### SALIENT FACTS

**Fully-proved light diesel engine developing 54 b.h.p; or 4 cyl. o.h.v. petrol engine, with long-life chrome bores, developing 53.5 b.h.p.**

**Full-forward control with over 11′ bodyspace on 8′ 2″ w.b. chassis or over 14′ bodyspace on 10′ 2″ w.b. chassis.**

**Exceptional manoeuvrability. Supreme driver comfort in all-steel cab with panoramic windscreen. Powerful hydraulic brakes.**

A ROOTES PRODUCT — BUILT STRONGER TO LAST LONGER!

KARRIER MOTORS LTD. LUTON BEDFORDSHIRE.

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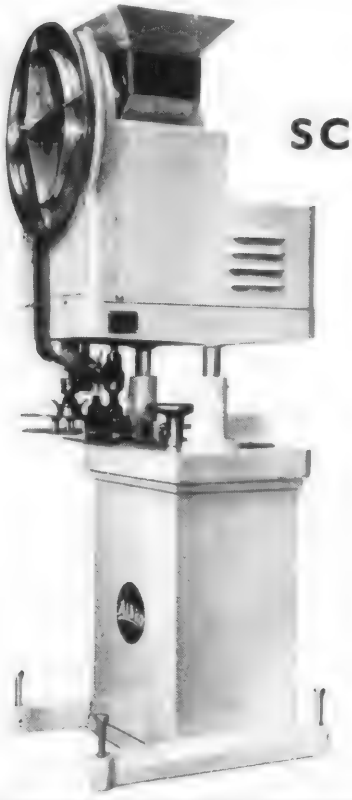

# New ALBRO

## SCREW CAPPER applies 60 per min.

A new ALBRO Screw Capper applies preformed metal or plastic caps to a wide range of bottles, tins and other containers at approximately 60 per minute, depending on the size of bottle and type of cap.

Known as the Single-Chuck Capping Machine, it is fully automatic, completely foolproof and can be incorporated in any existing production line.

A larger model, having an output of 120 per minute, is also available. Ask for full details and a demonstration.

## ALBRO Filling Machines

### for Liquids, Powders & Pastes

ALBRO FILLERS & ENGINEERING CO. LTD., WHARF ROAD, PONDERS END, MIDDLESEX

Telephone: Howard 2622 (5 lines) Telegrams: ALBROMACH, ENFIELD

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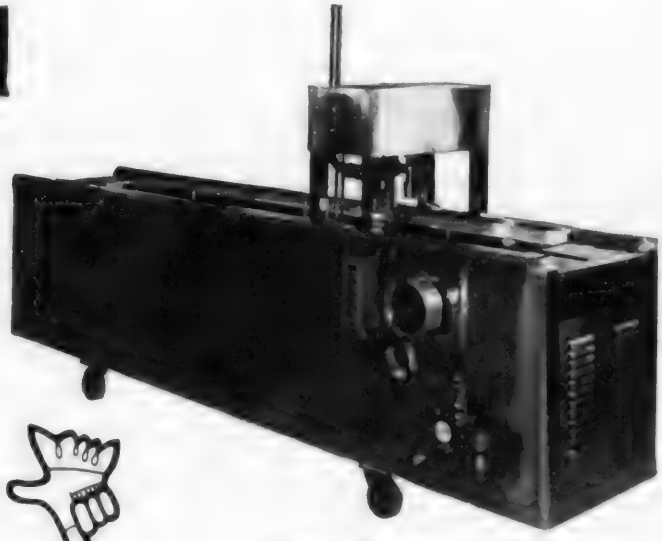

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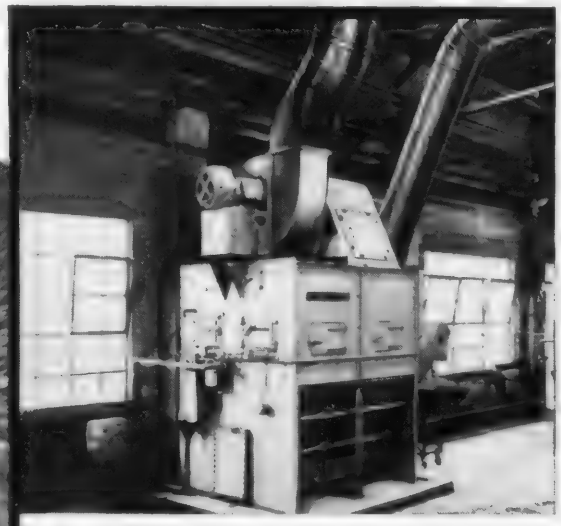

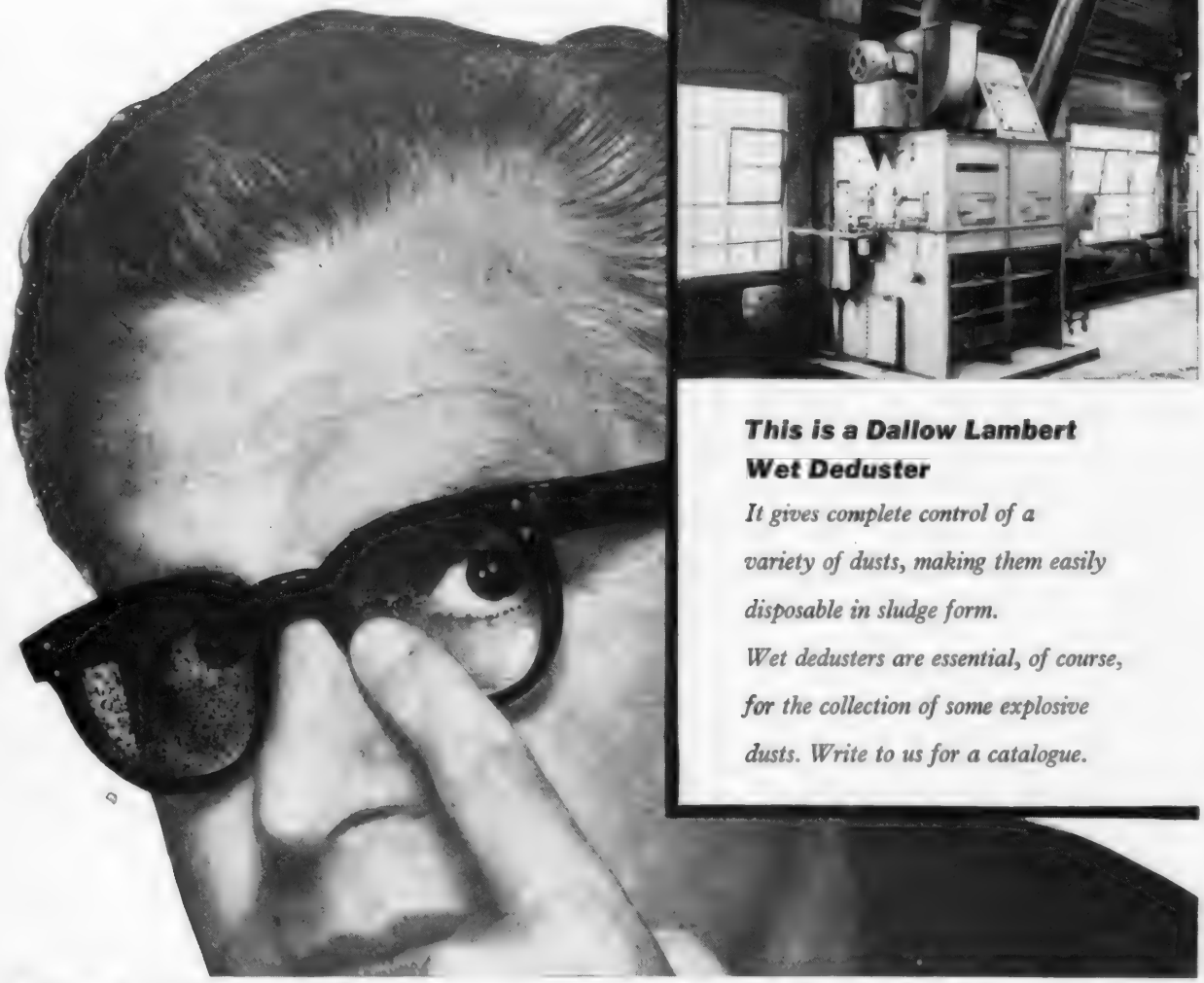

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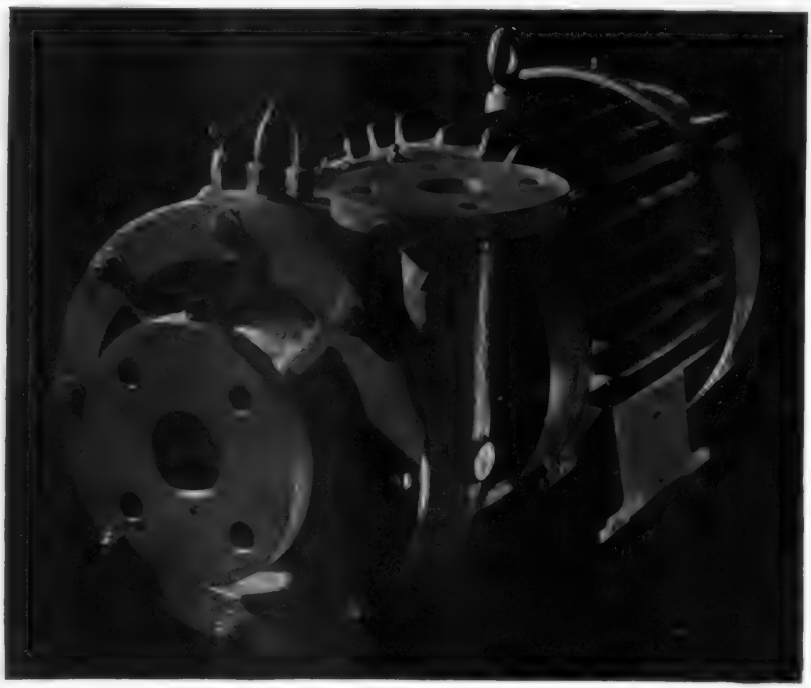

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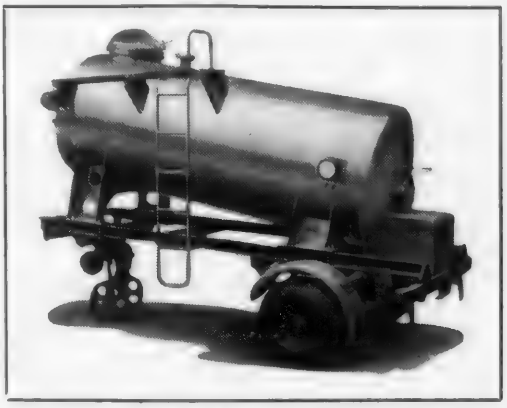

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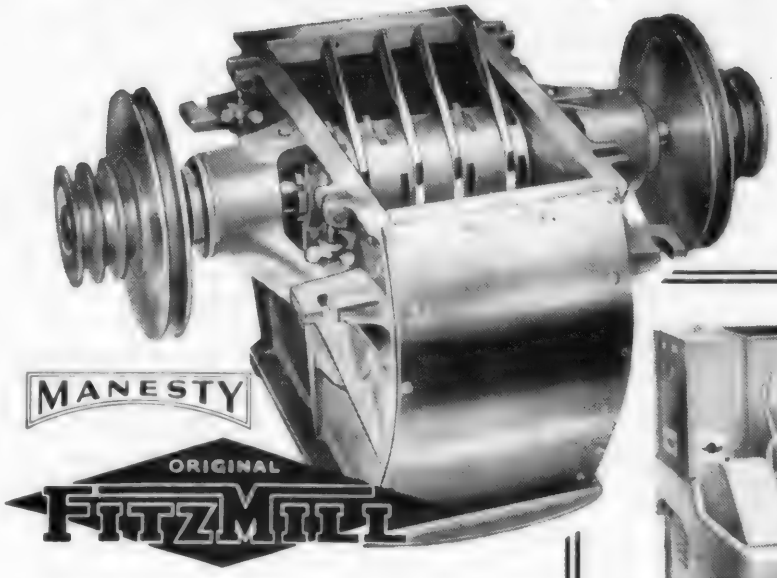


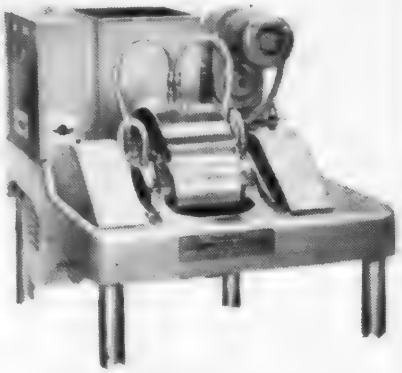

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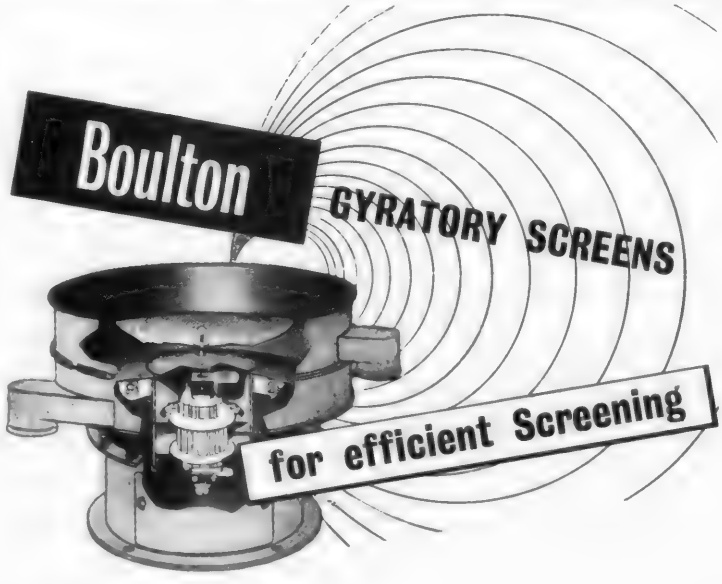


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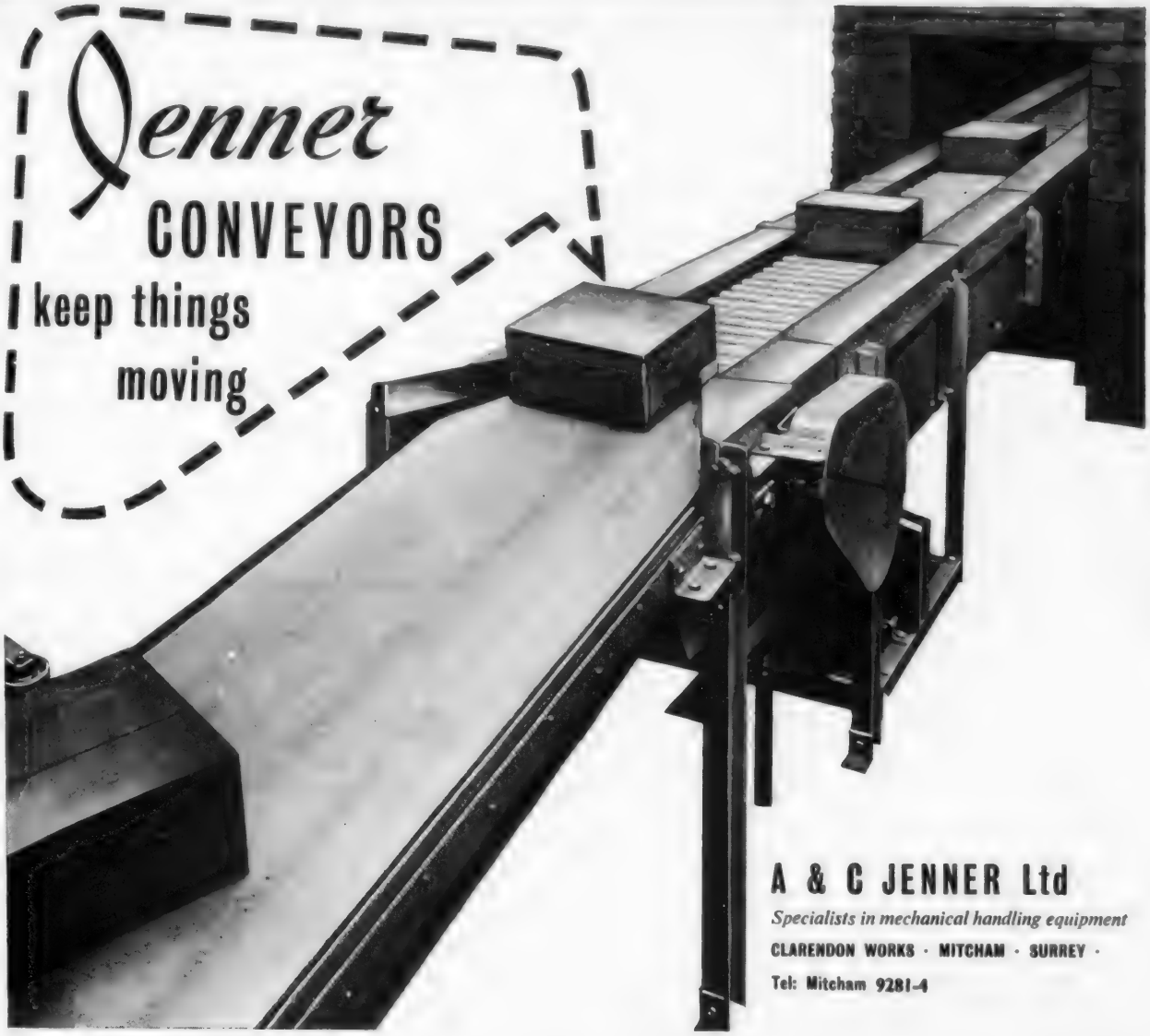

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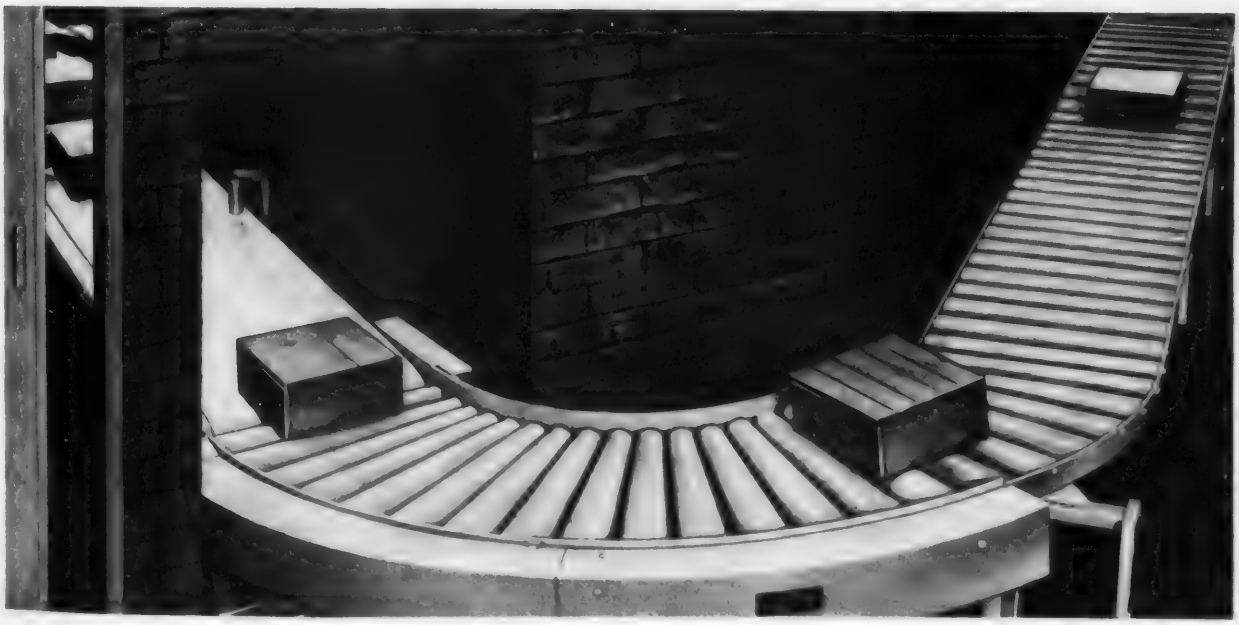

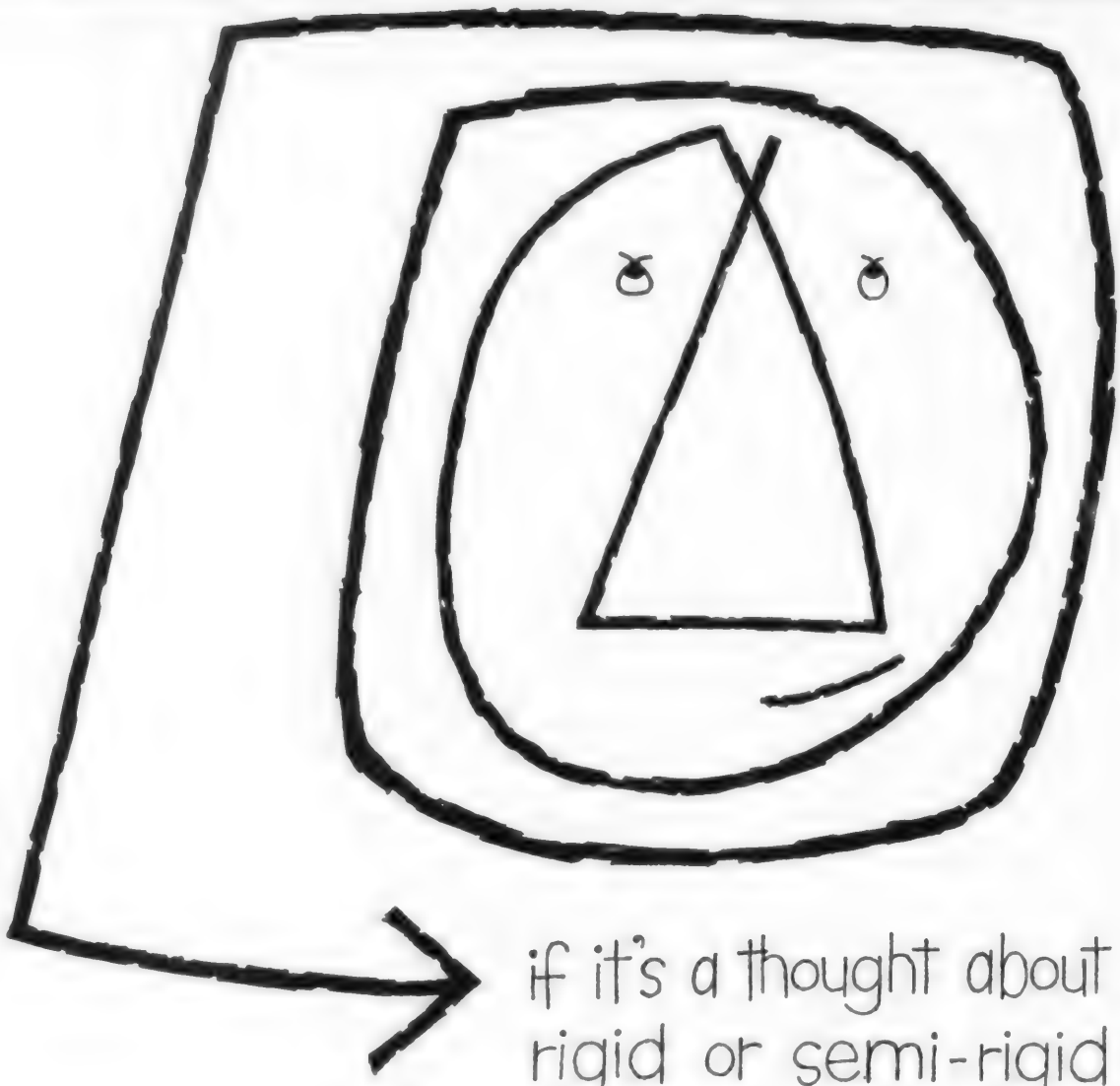

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# FOOD
# Manufacture

Volume XXXV. Number 12 Editor: Anthony Woollen, B.Sc., A.R.C.S., A.R.I.C. December 1, 1960

| | | | |
|---|---|---|---|
| Editorial | 497 | Packaging | 524 |
| Preserve Manufacture by C.W.S. | 501 | Advances in Food Technology | 526 |
| Sauce and Pickle Manufacture | 506 | News Digest | 527 |
| Equipment for Milk Processing | 509 | Food News Overseas | 532 |
| Gartons to double Glucose Output | 514 | Recent Patents | 534 |
| A Food Yeast Plant in Formosa. *By H. C. Chien.* | 516 | New Companies | 534 |
| Correspondence | 519 | Trade Marks | 534 |
| Machinery and Equipment | 520 | Index to Volume XXXV. | 535 |

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# FOOD
# Manufacture

Vol. XXXV, No. 12 December 1, 1960


## B.I.B.R.A.

AFTER a lengthy period of gestation, B.I.B.R.A., the British Industrial Biological Research Association, has at last been born. We welcome the dropping of the original name—Food Testing Research Association—but the new one grates harshly on the ears; why do these organisations have to choose titles which are cumbersome and ponderous? Be that as it may, it is good to know that at least the bare minimum funds required have been guaranteed, and that the Treasury has approved an industrial research grant commensurate with industry's contribution.

Industry's initial response has been adequate but hardly overwhelming. As mentioned in our news columns last month, food, chemical and allied firms who were canvassed have so far guaranteed just under £23,000. When the appeal was made a figure of £20,000 was fixed as the minimum below which the project would not be worth while. With the D.S.I.R. grant, the association is assured of an income of £44,000 p.a. for five years, but as the D.S.I.R. will put up an extra £100 for each additional £100 supplied by industry in excess of £22,000 up to a maximum of £25,000 p.a., the association could have an income of £95,000 if industry were to find half that sum.

So what about it? On reading the list of the 90 companies who have so far undertaken to support the venture we see many well known large firms and a goodly number of smaller ones, but there are some notable absentees. Perhaps these have been sitting on the fence waiting to come in when the magnitude of the response was known. As Professor Frazer has said, the association is "absolutely essential." Now it remains to appoint a director and to get on with the job as quickly as possible.

## Tell us what you want

OBSERVANT readers will have noticed several changes in the lay-out of FOOD MANUFACTURE in the last few months. The front cover has been changed, and some alterations made to the headings of our regular features. We do not approve of change for change's sake, but neither are we advocates of an inflexible rigidity and a refusal to move with the times.

The old cover served us well. It remained unchanged from the first issue in May, 1927, until July this year. It was certainly distinctive, but we felt that its rather old-fashioned woodcut style was somewhat out of keeping with contemporary trends.

By the time this issue appears all our home and overseas subscribers will have received a letter requesting them to complete and return a simple questionnaire. Replies are already coming in and the results are most interesting. The replies will enable us to assess what our readers want to read in FOOD MANUFACTURE and whether we are giving them what they want. The object of our endeavours is to make FOOD MANUFACTURE of even greater value and interest to the food industry executive. Readers rarely write and tell us what they like, but they frequently tell us what they don't like. This information, although useful, is rather negative; the planning of future articles is therefore often like a guessing game, with an element of conjecture as to whether such-and-such an article or feature will go down well. This may be jolly good fun for the Editor, but it would be a sounder situation if the guesswork were eliminated and the hard-headed reader with no time to waste were given exactly what he wants in the way he wants it.

If you, subscriber, will therefore spend a precious minute or so completing the questionnaire and posting it off, it will undoubtedly react to your advantage. We say "subscriber" because the number of readers is many times the number of subscribers. In this connection we urge large firms who circulate their copies of FOOD MANUFACTURE among big staffs to consider ordering more copies; it is a little hard on the assistant production manager when he receives his copy three months late because he is at the bottom of a long list. After all, he is frequently the fellow who does the job and he may benefit particularly from a piece of "know-how" published in our pages.

Most readers, therefore, will never see the questionnaire, but we invite their comments all the same. Tell us whether you like our factory articles, our reviews of machinery, our regular features; does the advertising help you, do you want articles

on specific subjects? In short, give us *your* ideas on how to make FOOD MANUFACTURE of greater value to *you*.

We shall in a future issue publish some of the comments and review the results of the survey. Be assured that all suggestions will be taken note of and acted upon where possible.

## *The power of advertising*

A STRIKING example of the effectiveness of massive advertising is shown by the rise in soup sales during the past twelve months. Last year, Campbell's entered the British soup market and by the spring, according to the *Financial Times*, had secured about 20% of the market. Far from gaining ground at the expense of other manufacturers, however, Campbells have stimulated such competition in a very undeveloped market that all manufacturers have increased their sales, and small manufacturers are appearing on the scene in growing numbers.

By American and Continental standards the Briton is a very small consumer of soup, eating (or is it drinking?) a mere three platefuls a week, compared with the two platefuls a day, summer and winter, which many foreigners consume. It was this fact which persuaded Campbells, after an extensive market survey, to build a factory in England and to plan for possible expansion in three or four years; however, these plans have proved inadequate, and plans to treble output have had to be made within a few months of starting up.

Canned soups are heavy favourites, packet soups accounting for about one-sixth of the total sales, which are now running at about £30 million per year. Many manufacturers think that the potential market is very much greater than this, and there is every sign of an intensification of the "soup war" during the coming months. Heinz, of course, have been test-marketing their packet soups in Scotland during the past few months, and Crosse and Blackwell are shortly to enter the market with a new range of soups.

## *Overweight bread*

WHAT a fuss the newspapers have been making about the baker who sold a loaf of bread 1 oz. overweight. This unfortunate fellow, it will be remembered, got into trouble because his nominally 10-oz. loaves were coming out 11 oz. The story goes that, tired of the monotony of it all, he was endeavouring to give his bread that little touch of individuality by adding an extra twirl. What a shame, said the press, that this poor chap should be branded for his generosity.

A fuss of a different kind, we imagine, blew up in the bakery manager's office. What business could long survive if 10% of the production were given away free? The law in respect of bread weights is not so silly as it seems. The legal weight of a standard loaf is 14 oz., and that of a "fancy" loaf is 10 oz. A little reflection will show that if the law were tolerant of the sale of overweight fancy loaves, a loophole would be opened for unscrupulous bakers to sell underweight standard loaves under the pretence that they were overweight fancy loaves.

## *Why look to the U.S.A.?*

THE LATEST gimmick in retail food selling is to endue the product with a synthetic American flavour (metaphorical, not physical). A new product now being extensively advertised by a well-known firm who shall be nameless is claimed to be made to an American recipe; "emphasis," says the publicity blurb, "is being placed on the American origin" of the product. Posters for display in retail shops show the product "against a background of New York skyscrapers."

Why? Is there anything outstanding about American food or recipes? Travellers who have returned from that country have almost unanimously agreed that whatever the virtues of that great country (and there are many) the food certainly is not one of them. The peculiar stuff which in America goes under the name of bread is too notorious to need describing. The perverted eating habits of the average American are such that even Americans are getting alarmed. Gargantuan tasteless steaks and excessively rich ice cream concoctions seem the commonest items on the American menu. We understand that fresh food is virtually impossible to obtain over there. A Briton of our acquaintance who voiced that very opinion to his host in New York caused alarm and dismay; "Do you not realise," said the host in shocked tones, "that these peas are deep-frozen within minutes of being picked? How much fresher do you want them?"

We are not in the least belittling frozen food. But anyone who imagines that such food is fresh in the same way as vegetables cooked and eaten within minutes of being picked in one's own garden is being deceived. Let's face it. Food processing is an evil. Lest our readers assume from this extraordinary statement that we have gone off our rocker, we hasten to add that under the circumstances of our way of life it is a very necessary evil, and becomes a virtue when compared with the far worse evils which ensue if food for our urban masses is not processed and preserved by modern methods. But the savage who kills an animal he has hunted and cooks the meat

over a fire in the forest probably has a tastier steak than the diner in an expensive restaurant who has served up to him a cut which has been kept in deep freeze for months and treated with tenderisers.

Selling anything is, as everybody knows, largely a matter of persuading the buyer to believe something which may or may not be true, and jolly good luck to the salesman. But trying to persuade the long-suffering British that American food is superior is positively the end.

## *How hygiene efforts are frustrated*

RECENTLY we gazed into a grocer's window. Displayed within were attractive piles of sausages, pork pies and other meat goods, all hygienically wrapped in transparent film. And into the topmost item in every pile was *spiked* a price tag.

Ye gods! we felt like fetching the grocer and spiking him with his own price tags. What is the good of processing and wrapping food under the most hygienic conditions if its fate is to be infected with a contaminated skewer before it reaches the consumer? Were those price tags ever washed? We doubt it. The price tags would go from pie to pie, harbouring corruption and spreading infection; somewhere a person would become ill with food poisoning. Perhaps the pie (and its manufacturer) would be blamed, but no one would know the real reason.

Such things are going on all the time, and it makes the heart sick. Once in a dairy we were watching bottles filled with pasteurised milk passing in an endless procession through a capping machine. One of the caps could not have been positioned properly, for the operator, unaware that he was being observed, removed the bottle, fished a knife out of his pocket, stuck it through the cap and prised it off, then replaced the bottle upstream of the capping machine and carried on without a care in the world. We take the purity of our food for granted. "What the eye don't see the heart don't grieve about." But hidden enemies of our health lurk in the midst of us all the time.

## *Menace of the birds*

WHAT can be done to prevent birds getting into food factories? The subject was raised at one of the Pure Food Centenary sessions, but no one seemed to have an answer; it seems to be beyond the wit of man to prevent our feathered friends from going where they will, and that means where food is.

Ultrasonics and electric shocks have, apparently, all been tried without permanent success. The R.A.F. solved the problem of preventing birds roosting in parked aircraft (it *was* a problem, we are assured) by placing bird corpses at strategic points; birds, like humans, view death with distaste and reverently keep clear of their deceased brethren. But this solution will not do in a food factory, for obvious reasons.

The problem is a real one, for no matter how well the points of entry into a large factory are sealed off, sparrows especially seem to find their way in somehow. They flit about among the roof beams with gay abandon, carrying germs and disease and depositing their droppings in the vats. Recently we saw numbers of the creatures hopping around a most modern and well-equipped plant bakery, perching on the tanks and, no doubt, adding their own unwanted special ingredient to the dough. Fortunately for the consumer, pasteurisation occurred in the ovens, but to use a Victorian expression, the circumstance was "not nice" and had we been the production director, we would have given the production manager such a blasting that he would speedily have found a method of getting rid of the pests. Unfortunately, being but a guest we could do nothing except gaze with speechless horror.

The cost of screening every window and opening is large; it was done at the C.W.S. preserve works at Reading, where bees and wasps were the problem. It cost them £900, and that factory, by some standards, is not particularly large. Some simpler method is needed, a scare ray, or harmless odour unsmellable by humans but revolting to birds. If any reader knows the answer to the problem, would he kindly get in touch with us.

## *The hazards of automation*

IT was 4.30 a.m. in the Wonderbread Co.'s plant bakery no. 3 at Munchingham. The hum of powerful machinery and the rhythmic twinkling of the panel lights were the only indications that an endless river of dough, 1,000 tons per hr. through each production line, 1 million loaves a day, were passing continuously to feed the hungry citizens of Munchingham.

Spike's job was simple. Once every hour he had to tip a bucketful of *Speedrise 81* into the mixer when a panel light flashed. *Speedrise 81* had recently been developed by the company's chemists. Provision for its automatic addition was being made, but meanwhile Spike added it by hand. He pressed a button when he had done so, otherwise the production line automatically stopped.

Spike felt the call of nature and retired awhile. The panel light flashed; it was time to add *Speedrise*. But Spike was not there, his button remained unpressed. The automatic stop mechanism came into play; warning lights flashed, alarm bells rang, and the whole mighty production line came to a halt.

The supervisor dashed to Spike's post. Where was Spike? If the plant engineers' mechanics were perfect their chemistry was not. In the holding vat, 3,000 tons of dough, already charged with *Speedrise* but no longer being withdrawn at the rate of 1,000 tons per hr., continued to rise. Remorselessly it expanded, reaching the top of the vat and overflowing. *Speedrise* was too good. Down on to the factory floor cascaded the dough, swamping all in its path. The supervisor stayed at his post to the last, telephoned the fitters, then fled for his life. The fitters arrived—too late! The situation was beyond local control. A frantic call to the nearest B*k*r P*rk*ns service engineer brought him on the spot with commendable promptness, but he never had a chance.

Police evacuated the neighbourhood as the creeping dough advanced through the streets. Game to the last the fire brigade dashed in, but in the slippery dough they slithered and fell, their hoses making no impression. To avoid casualties, a retreat was called.

All things come to an end, even the power of *Speedrise*. Into the local river cascaded the dough, and there its force was spent.

In the Wonderbread boardroom the atmosphere was tense. Never yet had Wonderbread let Munchingham down. "And we never shall!" declared the chairman in a voice of thunder. A million loaves had to be in Munchingham's shops by the morning. A telephone call to Ly*ns saved the day. Through the night the lorries trundled Munchinghamwards. The city's bread was safe, the munching Munchinghamians munched again.

A little notice now hangs beside Spike's post, which reads: "If you want to be relieved, first inform the supervisor."

## *A suggestion for cool cats*

SABOTAGING a rival firm's production by parading Louis Satchmo Armstrong and his jazzmen through the city streets tickles our sense of humour. At least, that was one (no doubt unintentional) result when the king of trumpeters, escorted by police and watched by 100,000 people, processed triumphantly through the streets of Accra as part of a publicity campaign organised by—guess who—P*psi-C*la of course!

We read in the press blurb that "employees at a rival bottling plant left their machines to cheer as Satchmo drove by at the head of a cavalcade of Cadillacs." A chronicle of Satchmo's progress through the Dark Continent in the cause of a certain soft-drink reads like the diary of a triumphant Roman conqueror. In the Congo, apparently, the inhabitants of that tormented country forgot their troubles momentarily when Satchmo blew in.

We suggest as a solution for the world's political troubles that all politicans and heads of governments abdicate and hand over power to those industrial concerns who cater for the pleasant and trivial side of life, with the condition that they use as ambassadors the Satchmo's and others whose names mean far more to simple people than the stuffed shirts who have got the world into its present mess.

## *A Christmas Reflection*

AT THE end of an old year and the beginning of a new it is customary to pause in our labours, say a few trite remarks about what has been and what, it is hoped, will be, and wish everyone the compliments of the season. The last we do in full measure. It is not our job, as the Duke of Edinburgh once remarked, to "peddle uplift." But where is the dividing line between manufacturing food and the larger affairs of life? Life cannot be divided into nice watertight compartments each separate from and independent of the others. A man may shut himself up in a comfortable houseboat but he would be a fool if he paid more attention to the interior furnishing of the houseboat than to the condition of the mooring rope.

If we are permitted to venture an opinion on matters not immediately connected with our avocation it is that certain aspects of our way of life seem uncomfortably similar to a beautifully fitted-out houseboat whose mooring rope has rotted through. And what is the mooring rope? Faith. This age is tormented by doubts precisely because it doubts. Look at the fuss that is being made about "overpopulation." Where is all the food to come from? It comes. "Be not solicitous" is a command unheeded now as it was nearly two thousand years ago when it was made, yet its compelling urgency is no less today. Are we therefore to sit back and do nothing? The question is absurd because man is a rational creature with the desire and the power to do things. He was made that way for a reason. What about all the dreadful things around us in the world, men hating and fighting one another, natural disasters, fears of the unknown that gnaw at our hearts? The faithless man cringes and seeks distraction; the man of faith sees these things not as obstacles to his faith but as challenges. Even personal disaster cannot move him because he knows that ultimately his spirit will survive. "Though you slay me, Lord, I will trust in you." These words of Job have point because he knew that if he trusted enough he would not be slain.

To celebrate Christmas without thinking of its meaning is to make a mockery of it. The happiness that we wish our readers this Christmas is the happiness that comes not from a multitude of possessions but from a peaceful soul.

(*Left*): **General view of the jam filling and packing section.** (*Right*): **A quality control point on the jam filling floor, where the physical properties of samples are checked.**

# Preserve Manufacture by C.W.S.

## *Reading works' multiple activities for year-round operation*

**Food takes up about 70% of the activities of the vast C.W.S. organisation, which manufactures on a large scale as well as distributes. The Reading Preserve Works, with the Acton Preserve Works, supplies the whole of the south of England and South Wales with jam, marmalade, canned fruit, pickles and other preserves. FOOD MANUFACTURE recently visited this factory, and the following article describes its varied activities.**

So well known is the Co-operative Wholesale Society to the people of this country that we need not delve deeply into the history of this organisation. Founded in 1863 to provide goods to retail co-operative societies, its ramifications, although still fundamentally based on the principle of returning profits to the customer in proportion to the amount he spends, now extend far beyond the mere supply of goods. It is, for example, a manufacturer on a vast scale—its first factory, opened in 1873, was a biscuit factory (this factory will be featured next month); perhaps not so well known is the fact that the C.W.S. is one of the largest farmers in the country, owning some 34,000 acres, and it is also among the three biggest flour millers in the country. The first mill was built in 1891, and the Society now owns and operates seven large mills, all equipped with modern machinery.

The Society is the second largest margarine manufacturer in the British Isles, and its margarine works at Irlam, near Manchester, will be the subject of a subsequent article.

Food has always provided the major part of the co-operative movement's trade, and today comprises about 70% of the C.W.S. sales to retail societies. In the year ended January, 1960, of the total sales turnover amounting to nearly £468 million, groceries and provisions accounted for over £326 million of this.

The Society employs about 52,000 people, and is run by 28 directors who are all elected by its member societies every four years. The member societies number about 1,000, of which some 900 are retail and the remainder agricultural.

### Reading works

The Reading Preserve Works is one of a group of four, the parent being at Middleton and the others being at Acton (London) and Stockton-on-Tees. It was destined to be opened in 1915, but the outbreak of war in 1914 upset those plans and for the duration the factory was taken over by the Government and used as a depot for the Royal Flying Corps. Accordingly it did not start operations until 1918. At the present time it employs a basic labour force of about 250 people, with 100-150 casual labourers in addition. Men and women are about equally divided. The factory is designed on composite lines to produce a wide variety of preserves; it therefore avoids the problem of redundancy when fresh fruit is out of season. The main products are jams, jellies, marmalades, pickles and sauces, salad cream, mincemeat, Christmas puddings, canned fruits and syruped and candied peels.

To illustrate the wide scope of the factory's production, there are a total of 92 varieties, including, for example, 21 varieties of jam, 7 of jelly, 7 of marmalade, 2 fruit curds, 5 specialised lines for bakers, 9 varieties of pickles, and 5 of sauces. In addition there

(*Left*): **The sugar dissolving plant.** (*Right*): **The electric weighing unit which automatically meters the correct quantities of fruit, pectin, cane sugar and invert sugar to the boiling pans.**

are special lines such as mango chutney and tomato chutney, and bottled vinegar which is brewed at Middleton and brought by road in 2,500 gal. tankers. Besides being bottled for sale, the vinegar is also used in pickle and sauce manufacture.

As another example of the multifarious activities of the Society, its glassworks at Worksop and Wigan supply the bottles, jars and other glassware for all C.W.S. purposes.

**Raw material supply**

Buying for the four C.W.S. preserve works is centralised, the group manager, Mr. A. G. Ward, buying for all the four factories. Most soft fruit is home grown, but there is increasing competition from abroad. Holland, and more recently, the Iron Curtain countries are competing increasingly strongly with British strawberry growers.

British growers are, however, making use of improved varieties of strawberries, which affects the factory in several ways. A variety which, on being picked, leaves the calyx behind on the plant is, as can be appreciated, of great value on account of the hand labour no longer needed to prepare the fruit, yet whereas the fruit in different regions used to mature at different times, which eased the load on the factory, now it all matures at the same time and has to be dealt with at once.

The management's policy is to turn as much fresh fruit as possible into jam when the fruit is in season, but it is obviously impracticable to process all the fruit in this way, and some of it is put down in casks with preservative ($SO_2$). Strawberries and raspberries are put down in the cold after being washed.

**Jam manufacture**

There are two jam production lines at the Reading factory, known as "rapid" and "slow." Basically they are similar, but the rapid line has a higher degree of automation and incorporates a *Hydroseal* jar filling, capping, cooling, washing, labelling and packing unit which was installed about two years ago.

The first stage in manufacture is visual examination of the fruit or pulp on an inclined translucent glass table which is illuminated from below, so that foreign matter such as leaves, stalks, etc., shows up clearly. This viewing apparatus is C.W.S. designed and made. The fruit falls by gravity off the end of the viewing table into a mobile collecting pan in which it is taken to a stainless steel pressure vessel sunk into the floor, into which the fruit or pulp is emptied by gravity.

Capacity of the pressure vessel is 1 ton and the blow-up pressure is 30 p.s.i. The fruit is blown to a holding vessel on the top (second) floor of the building.

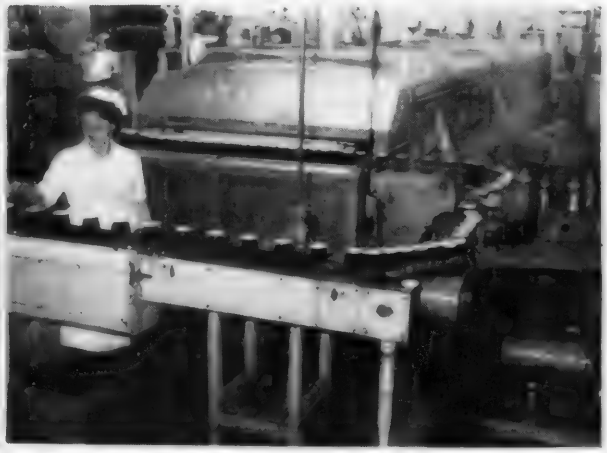
The next process is sieving, which is accomplished in a rotary brush sieving machine. Certain fruits which require the stone or seed extracted are then gravitated through this machine which is fitted with a cylindrical perforated screen of appropriate size mesh.

From the sieve the pulp falls by gravity into one or other of the two stainless steel storage tanks. These are fitted with steam heating coils and rocker-type agitators, and are also used for blending purposes.

From the storage tanks the material falls by gravity either to the boiling flat on the floor below ("rapid" line) or to seven boiling pans on the ground floor ("slow" line).

On the boiling flat are situated six rapid copper boiling pans arranged in a semi-circle and discharging into a common outlet. The filling of the pans is controlled from an electric weighing cabinet which automatically meters the correct quantities of fruit, pectin, and cane and invert sugar to the boiling pans. The ingredients are brought through glass pipelines to four automatic weighers, one for each ingredient, which weigh out the amounts for one batch and discharge them into a pressure vessel. The contents of this are then blown to one of the boiling pans.

Each pan is steam jacketed and fitted with a cowl which closes completely during the boiling operation. Steam and odours are led away through ducts fitted to



(*Left*): **The jam filling and capping machines, with the jar washer and steriliser in the background.** (*Right*): **Another view of the jam filling line, showing the cap sealing machine and the washer and steriliser.**

**Large jars of mixed pickles are filled by hand in this fashion, the pattern of filling being the same for every jar.**

the cowls. Boiling is controlled by temperature, the boiling being stopped when a temperature of about 224°F is reached. Average boiling time is 6 minutes. At the end of boiling the jam is discharged to a weighing machine and checkweighed; for jams and marmalades the final batch weight is 150 lb., and for jelly 100 lb.

From the weighing machine the jam, before entering the *Hydroseal* unit proper, is run by gravity into two water-cooled filling tanks fitted with swash-plate agitators to ensure even distribution of fruit.

**Jar handling**

The *Hydroseal* unit comprises jar handling, filling, capping, cooling, washing and labelling machines and has an output on jam of 100/125 1-lb. jars per minute.

First stage in the jar filling process is unloading the cartons of empty jars, which are put on a carton loader and unscrambler unit. The jars then pass through a washing machine along a jar conveyor to a rotary filer, from which they pass along another conveyor to the filling machine.

**Filling and capping**

The filling machine is of the rotary type and fills by volume. The jars pass to the sealing head which positions the lid, blows a jet of high pressure steam on to it to sterilise it and create a vacuum, after which the lid is sealed. The jars then pass through a cooling and washing machine over a rotary table and conveyor line, thence to a heater to be dried, another rotary filer, and then to a visual inspection point. There is an apparatus here, known as a *Walgren Vizor*, designed and made in the factory, which consists essentially of a large magnifying glass behind which the illuminated jars pass.

The jars then go to a labelling machine and are packed by hand.

It is claimed that this continuous production line can turn fresh fruit into packed jars of jam ready for delivery in one hour.

**Slow line**

This consists of a battery of seven slow boiling pans which take about 8 minutes per boil compared with the 6 minutes of the rapid set. The main difference is that ingredients have to be scale-weighed by hand, and output is, of course, rather less. This line is used only for lemon curd and certain special jams. There are two filling and capping units for ½-, 1- and 2-lb. jars; for the larger containers (7, 14 and 28 lb.) the product is bulked and weighed on a scale balance.

**Two views of one of the canning lines. (*Left*): Plums being filled into the cans by weight; empty cans are taken from the upper conveyor and the filled cans are placed on the lower. (*Right*): The cans are topped up with syrup from a sparge pipe beneath which they pass. The overflow from the cans is collected in a sump and pumped back to the header tank shown on the left.**

### Manufacture of pulp and jelly

Fruit for pulping is boiled in two autoclaves, each of 1 ton capacity, on the top floor. These have rotating stainless steel calandria-type heating units which agitate and heat the contents. The pulp is then sieved into one of the storage tanks, pumped to a header tank and filled by gravity through the bungholes into casks by weight on a scale.

In the factory classification, "jellies" are clear preserves containing no discrete particles of fruit. They are made by boiling the fruit in the calandria-type autoclaves and pumping the boiled material successively through two filter presses, one coarse and one fine. The juice then passes to the two storage tanks and is processed in the same way as jam.

### Preparation of fruit shreds

Three grades of marmalade are manufactured: jelly, standard and syruped thick shreds. Medium and coarse-cut orange and lemon shreds for the two last-named are prepared by cutting washed oranges and lemons into four segments in a quartering machine. The skin segments are then machine shredded or cut to requirements.

### Syrup production

For dissolving sugar there is, on the top floor, a dissolving tank fitted with steam coils and an agitator. Sugar is taken to the top floor by conveyor. To speed up the process there is alongside the dissolving tank a water heater which gives a continuous supply of hot water.

The syrup is filtered through a filter press fitted with nylon or terylene leaves precoated with *Dicalite*. After filtration, sugar concentration is 66%.

### The Cannery

Canning of English fruit in season is an important part of the factory's activities, such fruit being processed as gooseberries, cherries, rhubarb, strawberries, plums (golden, red and Victoria) and damsons. At the time of our visit efforts were being concentrated on plums; these were first destalked and washed in four Herbort machines; and unripe and bruised fruit removed by hand by women stationed on either side of the conveyors from the machines.

Among the machines in the fruit preparation department was a new Swiss machine for stoning fruit such as cherries and plums; the machine works by boring a hole through the flesh of the fruit and pushing the stone out through the hole.

There are two canning lines, each with an average output of 55 c.p.m. Filling of cans is by hand at filling tables, the cans being individually weighed. Filling with syprup is by continuous flow from a sparge pipe, the cans being tilted slightly to give a pre-

**Filling bottles of vinegar.**

**A destalking and washing machine. The plums roll down and are collected at the lower end.**

determined head space. Subsequent clinching, exhausting and seaming is conventional.

There are no retorts, the cans being sterilised in cookers at atmospheric pressure. After cooling somewhat the cans are taken to the basement storage by two can conveyors which purposely take a long course to allow the cans to cool further and drip-dry, thus saving cooling water.

A random selection of cans is checked for temperature of cooling, vacuum, headspace, weight, etc.

### Mincemeat and puddings

Manufacture of mincemeat is carried out at certain seasons, as is the manufacture of Christmas puddings, production of which was in progress at the time of our visit. Among the machinery for preparing puddings is a new filling machine and 13 steam pressure retorts in which the puddings are cooked.

The pudding mixture is filled into paper cups which are then placed in multi-moulds in stackable tray form. These are then loaded into the steam retorts and after cooking and drying are packed into *Foilpak* basins and thence into cartons for despatch.

Fat for the manufacture of puddings is *Sutox* brand, made in the C.W.S. margarine works at Irlam.

### Pickle production

Pickles are manufactured all the year round. Most of the vegetables used are imported from Holland. Vinegar comes in tankers from Middleton, and is coloured with caramel as required.

The pack made in the biggest quantity is the 10-oz. size. Mixed pickles are packed by hand in a specified pattern.

### Syruped and candied peels

Orange, lemon and citron skins in brine are washed, strained and blanched before curing in sugar syrups. After draining for Cut Mixed Peel, the skins are diced on *Speedy* cutting machines, to be afterwards packed in 4-oz. and 8-oz. waxed cartons of a novel design. They are also packed in bulk for confectionery purposes.

For Candied Peel the skins are specially selected and the whole cured caps are stove dried and candied, afterwards being cooled and dried at room temperature before being packed into 4-oz and 8-oz. window cartons and bulk containers for retail loose counter trade.

### Quality control

The quality control laboratory has three chemists and three assistants, and constant routine analytical checks are carried out on all raw materials and products.

In the jam department, additional refractometer tests are carried out in the production lines by the supervisors, all of whom carry pocket refractometers.

### The factory

Points of particular interest from the hygiene aspect are the tiled walls and tiled floors in the pickle department, the cork-asbestos wall coverings in the jam department to prevent condensation, and the outer window coverings of gauze to prevent entry of wasps and bees when the windows are open. The last-named protection cost £900 to install.

### Planning of work

Employees are paid an incentive production bonus. To achieve maximum output with the minimum of effort, every job is standardised. Every task is studied, the simplest ways of doing it are thought out, and the task then broken down into a number of simple movements and operations which are laid down in writing and posted up for all to see. The operator therefore has no excuse for performing any operation in a way different from that laid down.

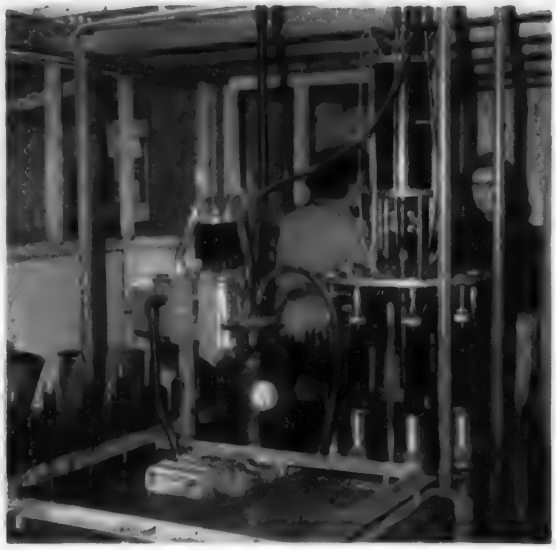
### Welfare

Attached to the factory is a nursing sister who treats minor accidents, interviews all newly recruited employees, and regularly visits sick employees in their homes.

### Despatch

The factory's total output is about 300 tons/week. All despatch is by road direct to the shops. The factory has the largest

*(Concluded on page 515)*



(*Left*): One of the sieving and pulping machines through which "O.K." Sauce passes from the boiling pans to the 100 gall. oak casks in which it cools. (*Right*): An automatic filling unit.

# Sauce and Pickle Manufacture

## *George Mason and Co.'s London factory*

**FOOD MANUFACTURE recently visited the Wandsworth factory of George Mason and Co., Ltd., makers of the well-known "O.K." Sauce and other products, the manufacture of which is described in this article.**

ONE'S immediate impression of George Mason and Co., Ltd., makers of *O.K.* Sauce as well as of a large number of sundry food supplements, is that here is a small but successful and expanding firm which has more than held its own against the large companies. So successful are its activities that it finds difficulty in maintaining production to keep pace with orders, and it is contemplating expansion within the limits set by its rather restricted factory site at Wandsworth, in south London.

### History

The firm was founded in about 1880 by Mr. George Mason, who, after having been employed by a company manufacturing invalid food for some years, set up in business on his own account in Chelsea, London, to make similar foods, mainly chicken and beef essences. A private limited company under the name of George Mason and Co., Ltd., was registered on November 21, 1884.

As a result of a disagreement with his colleagues he resigned his position as managing director in 1891, but continued as a traveller until 1895, when he finally was dismissed from the firm. Meanwhile, Mr. Percy Cooper took over as manager, and eventually became company secretary.

The original *O.K.* Sauce was the product of Mr. Mason's fertile mind, and won many awards at exhibitions, both in this country and overseas. When Mr. Cooper joined the company its policy expanded to cover products other than invalid foods and *O.K.* Sauce, and other recipes were evolved to include tomato ketchup, curry powder, beef cubes, jellies, potted meats, etc.

Expanding business necessitated a move to Walham Green in February, 1896. After a few years of rather heavy going for the company, the solid foundation of the company's future success was well and truly laid, and although the First World War caused at first some difficulties, it later occasioned much increased business as a result of supplies to the forces and, later, to the N.A.A.F.I. The present chairman and managing director, Mr. Rex Cooper, son of Mr. Percy Cooper, was made general manager and became a director in October, 1925. Continuing expansion forced a second move to the present site at Southfields, which took place on December 31, 1928. Mr. Percy Cooper died in 1931.

The last war caused some of the company's products to be discontinued, some of which have not been reintroduced. After the war conditions became easier, and a

large warehouse in Wimbledon, used to this day, was bought to provide additional storage space. Another warehouse was opened in Manchester in 1956, and it is intended to open another one soon in Warrington. Besides these establishments, the company owns a small factory in Dover where some of its products are made.

**O.K. Sauce manufacture**

Most of three floors is devoted to the manufacture of the well-known *O.K.* Sauce. On the top floor the ingredients—which include raisins, dates, tomato purée, minced lemon, sugar, molasses, orange pulp, and spices—are assembled and weighed into amounts for the half-ton batches, of which very many are made daily. The weighed ingredients are lined up in stainless steel trays for inspection by the supervisor before they are transferred to the 100-gallon steam-jacketed boiling pans in which the batches are made. Malt vinegar is delivered by road tanker 1,400 gallons at a time, and is stored in a tank on the roof.

At one time sauce manufacture fluctuated rather widely with the season of the year, but, like so many other food products, seasonal variation is now very small, and production is more or less constant throughout the year.

Having been transferred to the stainless steel pan, the batch is brought to the boil, which takes about half an hour, and is then boiled for one hour, with occasional stirring by means of a wooden stirrer. The batch then stands for three-quarters of an hour before being run down under gravity to the pulping machine on the floor below. Soluble solids content at this stage is about 35%.

**Maturing**

On the floor below there are four stainless steel pulping machines which are fitted with rotary brush sieves. Each machine serves four boiling pans. The contents of one pan take two or three minutes to run through the pulping machine, which separates the liquid pulp from the solid matter such as bay leaves, coarse fruit particles, etc. The finished product is collected in 100-gallon open-ended wooden casks, and the rejected matter is later removed and burnt.

When the large cask is full it is wheeled to another part of the pulping room, where it remains undisturbed for one week, during which it cools and caramelisation occurs. At the end of this time the cask is wheeled over a stainless steel chute connecting with another pulping machine on the ground floor beneath, the base plug is removed and the contents allowed to run by gravity down the chute.

Casks, of course, are dealt with in rotation, so that all remain for the specified time in the pulping room while maturing occurs, and every batch is sampled and tested for acidity, solids content, viscosity, colour, flavour, etc., in the quality control laboratory.

**Filling and packing**

The matured sauce from the floor above is passed through another pulping machine, and the liquor is collected in a large wooden vat which holds five batches. From this vat run several supply lines to the various filling lines.

On the ground floor there are five filling lines devoted to *O.K.* Sauce, three for 8 oz. size bottles, one for 5 oz., and one for 10 oz.

Each filling line has a rotary filler which fills bottles automatically, a capping machine and a labelling machine, which applies first the large labels on the sides of the bottles and then the small labels round the neck. Each line works at a rate of about 65 to 70 bottles per minute.

There is in addition a 5 oz. line which is equipped with American machinery and which is in a separate room.

In this department there are also two other filling lines for the sundries, such as Mint Sauce, Mustard Sauce, Sweet Pickle, Sauce Tartare, etc.

**Sundries**

In this department are made many of the other products of the firm, which include tomato ketchup, mint sauce, two kinds of

**Ingredients for " O.K." Sauce are boiled in these steam-jacketed stainless steel pans.**

Sweet Pickle, Continental Mustard, Salad Cream, Fruit Chutney, Mustard Sauce, Sea Food Dressing, French Dressing, and Sauce Tartare. Mint Jelly and Horseradish Sauce are made at the company's Dover factory.

This department is equipped with a number of stainless steel steam-jacketed pans, mixers, and high-speed stirrers, and the ingredients for each kind of product are weighed out, mixed, and boiled in these pans. The batches are then either ladled by hand or pumped into receptacles which feed either the automatic filling lines in the filling department described in the preceding section, or small, semi-automatic fillers in the sundries department. In the latter case, the fillers are followed by capping machines.

**The cooling floor, where the sauce is left to cool in 100 gall. oak casks. This natural cooling and maturing process takes about a week.**

**A fully automatic filling and capping unit for 5 oz. bottles.**

**Bread Sauce**

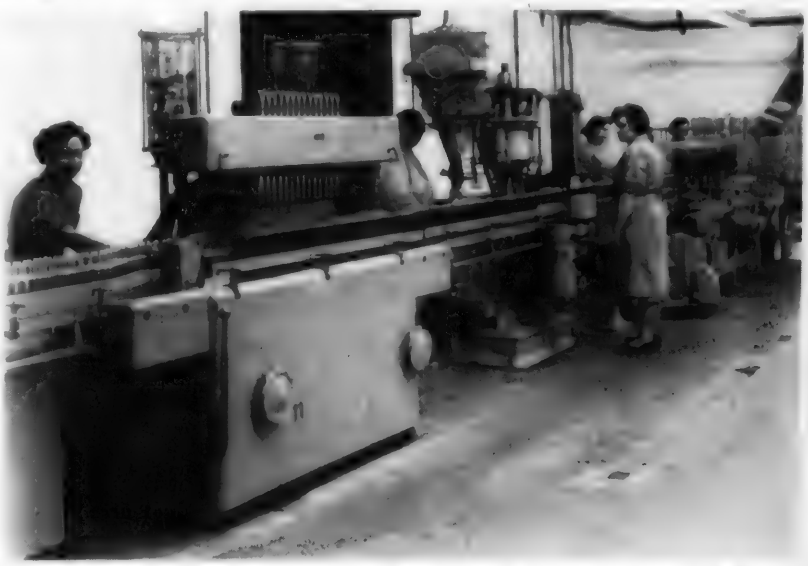
The latest of the company's products is Bread Sauce, a packet powder and the first of their powdered products.

At present it is being made on a small scale on an experimental line which the company plan to expand as machinery becomes available. Included in this line is a powder filling machine for filling the material into bags of plastic film.

The new product has been well received on the retail market, and the company hopes shortly to expand production of this line considerably. The reason for choosing a plastic bag is to prevent moisture contamination of the material, which would seriously affect it.

SOME SUPPLIERS OF EQUIPMENT

Alfa-Laval Co., Ltd.
Alite Machines, Ltd.
A.P.V. Co., Ltd.
Wm. Brierley, Collier and Hartley, Ltd.
W. P. Butterfield, Ltd.
J. Collis and Sons, Ltd.
Gravfil Machines, Ltd.
Lansing Bagnall, Ltd.
Morton Machine Co., Ltd.
Pneumatic Scale Corporation, Inc.
Purdy Machinery Co., Ltd.
G. D. Peters and Co., Ltd.
Silverson Machines (Sales), Ltd.



**A section of the "O.K." Sauce filling department, showing an automatic line.**

# EQUIPMENT for MILK PROCESSING

*The Dairy Show this year produced few surprises in the processing field, but two items of interest were the new aseptic filling technique and the increased emphasis on equipment for bulk collection of milk from farms. These developments are described in the following FOOD MANUFACTURE survey, which although not a review of the Dairy Show, mentions a number of items of interest to milk processors.*

THIS year's Dairy Show was more remarkable for what it did not exhibit than for what it did. Emphasis on machinery and equipment was less than in previous years, which perhaps indicates the general lack of advance in milk processing techniques in this country in recent years, borne out by the notable absence from the show of a number of large engineering firms.

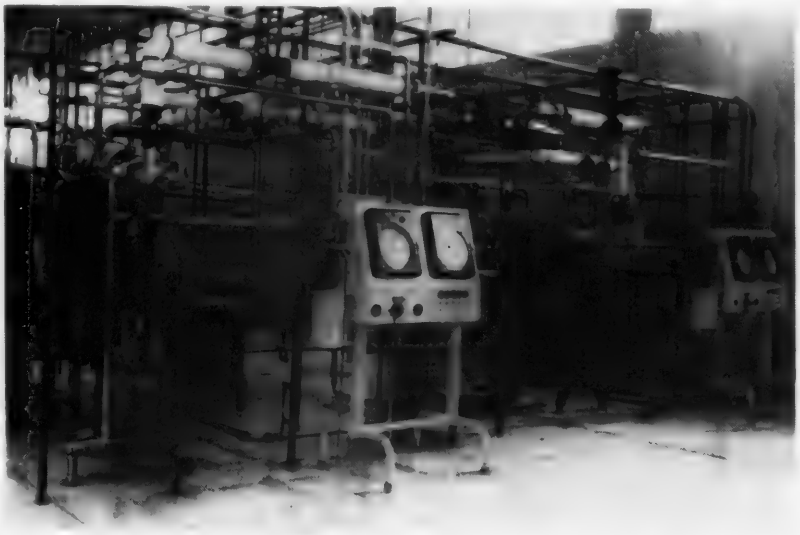
Probably the two most notable recent developments are the Tetra Pak aseptic filling machine and the increasing use of bulk farm storage tanks to simplify the collection of milk from farms.

## PROCESSING PLANT

### Ultra high temperature heating

The continuous sterilisation of milk at 275°F. in a high pressure plate heat exchanger was first introduced by the A.P.V. Co. in 1950 and has been widely adopted in some overseas countries, notably Japan, not already wedded to high temperature short-time pasteurisation. This produces a longer keeping milk than pasteurisation without the effect on flavour and colour associated with in-bottle sterilisation. This is because the holding time is only a few seconds.

The process is also in use in some dairies in this country but its general use must wait upon the development of a satisfactory method of sterile bottle filling before its advantages can become fully exploited. At present British dairies generally follow the ultra-high temperature milk heating plant, as it is called, by in-bottle sterilisation for as long as is necessary to destroy any re-infection by the bottle but not long enough to affect flavour to any appreciable extent.



**Two APV ultra high temperature milk heating plants at the Miyagi Dairy, Japan. There are 25 of these plants in Japan.**

The A.P.V. plant is similar to the H.T.S.T. pasteurisation plant but has a *Paraflow* heat exchanger and associated equipment for operation at high pressure.

### High temperature short-time pasteurisation

This milk treatment process, now virtually universal, has been developed by the A.P.V. Co. in the direction of compact stainless steel units that provide precise and automatic control with easy cleaning. These standard units are in use all over the world and have given this country an acknowledged lead in this field.

The basis of this plant is the *Paraflow* plate heat exchanger, first introduced by A.P.V. in 1923 and now perfected with its auxiliary equipment to a point where it is difficult to visualise room for much further improvement.

### Plate evaporator

The introduction of the A.P.V. Plate Evaporator in 1957 was regarded in milk processing circles as a notable advance on the conventional tubular evaporator and the subsequent sales all over the world have confirmed this.

This evaporator employs plates instead of tubes and operates on a single pass climbing and falling film principle. As a result it has a short heat contact time and very low circuit capacity. Operation is extremely simple and stable as there are only two manual controls and it can be run for long periods without attention.

An outstanding advantage is its low headroom requirement and flexibility in layout. This means greatly reduced installation cost and it can generally be accommodated in existing buildings. The heater opens giving full accessibility to the plate surfaces, making cleaning easy.

**Cream treatment unit**

The deodorisation of butter cream is a necessity in some countries where weed flavour is prevalent at certain seasons. The plant developed by A.P.V. in conjunction with New Zealand creameries is now widely used for this purpose.

The plant operates on a distillation principle and combines pasteurisation by a *Paraflow* plate heat exchanger. It is available in one, two or three stages according to the degree of treatment required.

**Homogeniser**

The sale of homogenised milk is increasing and in the U.S.A. and Canada forms a large part of the milk sold. In the processing of many milk products it is a virtual necessity.

The process consists of forcing the milk through a small aperture at an extremely high pressure by means of a stainless steel high pressure positive pump.

The original homogeniser was the Gaulin, made in France, but subsequently made in the U.S.A. as the Manton-Gaulin. It is now also made in Great Britain by A.P.V. and is claimed to have by far the world's largest sales of any homogeniser.

**Roller dryer for powdered milk**

Roller drying methods are generally similar universally and no revolutionary developments have been made in this field within the last few years. However, one development in the last year is a new type of doctor blade introduced by Bertrams, Ltd. The doctor or scraper comprises a steel blade mounted on a rigid carrier bar fixed between the machine frames, the blade running the full length of the roller. Normally the blade is held by a clamp plate which has a large number of small set screws so that the blade can be adjusted locally on the roller.

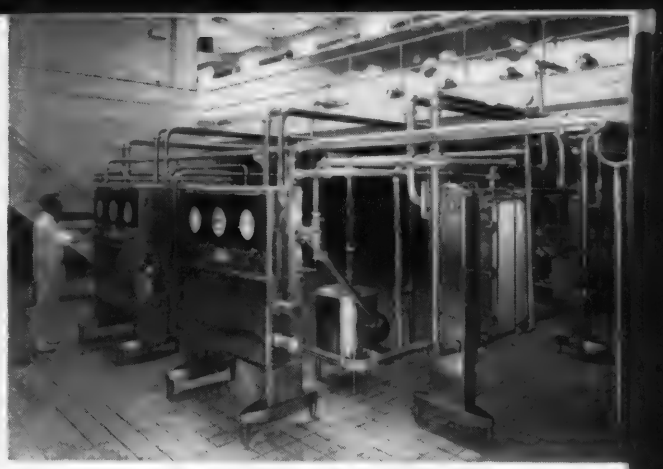
This design is far from ideal because to obtain efficient doctoring the setting and adjusting is very critical. The new type of doctor is claimed to require no manual setting or adjustment. The blade is held between a series of air pressure bags which run the full length of the blade, and pressure can be applied to the tip of the blade by supplying air to the appropriate bags. The air pressure is controlled by means of a reducing valve, and the blade can be raised from the roller or can be made to oscillate at an adjustable stroke and speed. It is claimed that this doctor can be fitted to any make and size of existing machine.

## FARM TANKS

The Dairy Supply Co., Ltd., say they have installed a large number of farm tanks for bulk milk collection in both England and Scotland. For some time, the outer bodies of these tanks have been made from both glass fibre and stainless steel. The glass fibre construction has proved very successful and is more efficient and economical to operate. Nevertheless the stainless steel type is still available for those who prefer it.

This firm's tanks at the show ranged from an 80 gal. packaged unit with integral refrigerating unit (a suitable size for the smaller producer) to the largest tank at present being made, a 400 gal. glass fibre tank.

**Farm tanks.** (*Left*): **A 350 gal. glass fibre farm tank made by the Dairy Supply Co., fitted with automatic ice bank control.** (*Right*): **The Graham-Enock tank of double-walled stainless steel, the refrigeration unit for which can be remotely mounted.**



*(Left):* **An APV double effect plate evaporator at the Land o' Lakes Creamery, Whitehall, Wisconsin, U.S.A.** *(Right):* **An APV "Paraflow" milk pasteurisation plant, type HMB, and stainless steel milk storage tanks at Malmesbury and Parsons, Ltd., Bournemouth.**

Graham-Enock Manufacturing Co., Ltd., have introduced a refrigerated milk storage system which comprises two units, a milk cooling and storage tank and the refrigerating unit. The former is a double-skin stainless steel vessel available in 125, 250 and 375 gal. capacities, containing a concealed serpentine corrugated ice water track completely embedded in foamed plastic. It has a heavy close-fitting counterbalanced lid. A motor-driven agitator and thermostat keep the milk at a temperature of 40°F. The refrigerating unit comprises an insulated ice-making tank, a compressor and an ice-water circulating pump. The unit can be installed remote from the milk tank and coupled with p.v.c. piping. Optional in-place cleaning can be provided using for this purpose the existing water pump.

## INSTRUMENTATION

### Level control

One problem in milk processing is accurate, reliable and, above all, hygienic, level indication and control in glass-lined and stainless steel tanks, etc. Suitable instruments have been developed by Fielden Electronics, Ltd., who in 1951 originated the *Tektor* controller and the *Telstor* indicator. Both units consist of an electronic unit and an electrode, the latter being inserted into the container.

In the *Tektor*, the principle of electrical capacity is employed to detect the approach of any substance to (or recession from) the probe. The consequent change in capacitance is made to actuate the relay which can switch in an audible or visible alarm, or control feeding mechanism to maintain a predetermined level in the container. The substance does not need to touch the probe, but should this be necessary it can be coated with a suitable material.

With the *Telstor* the capacity change is dependent upon the portion of the electrode covered, this electrode being sensitive to changes of the substance surrounding it down its whole length. The amount of change of capacity is noted by the electronic measuring bridge and is shown on the indicating meter as height, depth, etc., as desired.

This method of level control has a considerable advantage where hygiene is of supreme importance. The electrode, the only part of the instrument in direct contact with the material, may be made of anti-corrosive metals and also, if necessary, sheathed with plastic insulating material which will obviate contamination.

### Automatic weighing

A weight measuring and control system which has no moving parts and which is suitable for use in dairies, ice-cream plants, etc., is made by Elliott Brothers (London), Ltd.

The basic element of the weighing system is the Elliott load cell. This consists of a billet of metal to which four strain gauges are bonded by a special process. The strain gauges are wired in the form of a Wheatstone bridge and are arranged so that when a load or pressure is applied to the billet two gauges are subjected to tension and the other two to compression. The resulting resistance changes in these gauges produces an off-balance in the bridge circuit. The bridge is supplied with a constant a.c. potential and the out-of-balance signal is normally measured on a potentiometric type indicator or recorder.

The output signal of the load cells is in the order of 2mV per volt excitation. In a particular set of equipment already serving the dairy industry, the mixing vats are mounted on four such load cells, the outputs of each load cell being summated by parallel connections. The cells can, of course, be connected in either series or series-parallel to accommodate wide variations in nett/tare weight ratios. The flexibility of this equipment allows for a very marked economy in that the weight of all four vats can sequentially be indicated on one large dial weigh indicator by a simple selector switch, the tare weight of each of the vats being offset by various resistances in the selector panel.

The desired quantities of the various ingredients for each mix are programmed by peripheral set points on the weigh indicator and are accomplished by the operation of electrical on/off controllers. In this manner the correct proportions by weight of the solids and milk are fed into one vat and this operation is being performed

whilst the other vats are operating on their mixing cycle.

The vat selection switch, indicator and control equipment are all mounted in one free standing cubicle panel together with various signal lights to indicate the state of operation of the plant.

Theoretically, it is possible to use a similar system of feeding batch ingredients into an unlimited number of vats. Practical considerations however, tend to limit this to not more than twelve, limitations being imposed by the time of operating cycles. Even so these limitations can be quite easily overcome by a suitable number of indicators.

The overall accuracy of the system can be maintained, it is claimed, at $\pm\frac{1}{2}\%$.

## MILK PACKAGING

### Aseptic filling

By dispensing with bottling machinery, a closer approach to aseptic filling has been made with the advent of the Tetra Pak aseptic filling machine, shown at the Dairy Show by Dairy Supply Co., Ltd., and perhaps the most significant event of the show. This machine is so designed that, providing a dairy can supply sterile milk to the machine, it can pack the sterile milk under aseptic conditions into aseptic paper. The base of the machine is similar to the normal Tetra Pak machine, but the superstructure and the paper roll holder are entirely new.

**The Model H industrial tank cleaner, made by C.P. Equipment, Ltd., shown mounted on a stand for cleaning totally enclosed vessels with only a side entry.**

To achieve sterility and aseptic conditions during packaging, many methods can be used. For British conditions it is likely that sterility of the paper will be achieved by the use of a form of gas which will destroy any bacteria that may be on the paper.

From the cassette which contains the paper and in which the paper is sterilised, paper moves to the superstructure, which is totally enclosed from atmospheric conditions. Sterilisation of the superstructure before packaging can again be done in many ways, but the most likely method will be to use hot sterile air. When the superstructure is sterilised, cold sterile air can be put into the superstructure to give a pressure higher than atmospheric. This pressure will be continued throughout the period of packaging, thus obtaining the aseptic condition.

The general operation of the machine is entirely mechanical. The paper is mechanically conducted from the reel through the sterile superstructure to the point at which the sterile milk is filled. At no time is the human hand required to guide the paper, as happens with the normal Tetra Pak machine. The operator, when ready, merely presses three buttons, after which the operation is continuous.

The type of paper used is likely to be the normal Tetra Pak paper which is not a waxed but a polythene-coated carton in which the milk is entirely enclosed in polythene.

### Bottle washing machines

Two bottle washing machines manufactured by the Thomas Hill Engineering Co., Ltd., for milk bottlers are the *Grangemouth Hydro* for small and medium-sized dairies, and the *Kingston Hydro* for larger dairies.

**(*Above*): The type J3 "Tektor" level controller, and (*below*): the type LF3 "Telstor" continuous level indicator, both made by Fielden Electronics, Ltd.**

The *Grangemouth Hydro* is a compact unit requiring only 6 ft. by 7 ft. floor space. Three models are available (small, medium and large) with top outputs of 120, 180 and 240 dozen bottles per hour, respectively.

Rotation on this machine is either clockwise or anti-clockwise, and it permits multi-size bottle accommodation.

### Bottle handling

The *Kingston Hydro* is manufactured in various models also. Outputs are from 200-400 doz. per hr. (on the 8-bottle wide machine) to 400-800 doz. bottles per hr. (on the 16-bottle wide machine).

Two types of machine are available; one giving single temperature detergent treatment and the other triple detergent treatment up to 165°F.

The feed arrangement is semi-automatic, although the bottles are discharged automatically on to the bottle slat conveyor for filling.

Two new machines by the same company are their *Uniline* bottle unscrambler and *Speedline* bottle slat conveyor.

The first is a fully automatic unit designed to marshal a mass of bottles into a single line ready

**This " Grangemouth Hydro " cleans bottles at Forge Valley Dairies, Scarborough.**

for delivery to machines providing high-speed automatic processes such as cleaning, filling and capping.

All shapes and sizes of bottle from 5 c.c. to 40 oz. can be dealt with, and outputs are up to 1,000 doz. per hr. on the standard unit. Multi-operator units for any output are also available.

The *Speedline* is a new stainless steel slat conveyor, constructed to attain particularly high outputs and to meet the special hygiene demands of milk bottlers.

## CLEANING

### Tank cleaner

A new type of automatic industrial tank cleaner made by C. P. Equipment, Ltd., can be used for sterilisation. It is the Model H industrial tank cleaner, which incorporates a water-driven turbine which rotates the nozzle assembly through gearing. The cleaner will work in any position and can be lowered into a tank at the end of a flexible hose. Alternatively the unit can be provided with a four-legged stand mounted on rubber feet. The stand is collapsible and will pass through a hole of 8 in. diameter. The cleaner will work effectively at pressures of between 40 and 150 p.s.i. although the most efficient and economical cleaning action is obtained with a pressure of approximately 114 p.s.i. The cleaner can be used with hot fluids at temperatures of up to 203°F., and can thus be used for sterilisation.

The firm have added to their range of hydraulic jet cleaners the *Super Booster* cleaner. This equipment will operate on steam pressure as low as 5 p.s.i. up to 100 p.s.i., giving output pressures of from 100 p.s.i. to 400 p.s.i. As with other models of the Hydraulic Jet Cleaner this model will economically meter detergents up to 25% of the total throughput of high pressure hot water.

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▶ Two leaflets, *A*335 *APV Plate Evaporator and A*336 *Pasteurisation of Liquid Egg*, have been published by the A.P.V. Co., Ltd. The first gives details of the plate evaporator which is stated to be based on a combination of the climbing and falling film principles. The second leaflet describes the liquid egg pasteurisation plant which may be used to destroy all infections which may be present in frozen liquid egg, artificial cream and other liquid materials which are liable to carry infection.

# Strontium 90 in Human Diet

The third of the Agricultural Research Council's series of reports* has now been published. It contains an assessment of the average level of Strontium 90 in the diet as a whole during the year 1959.

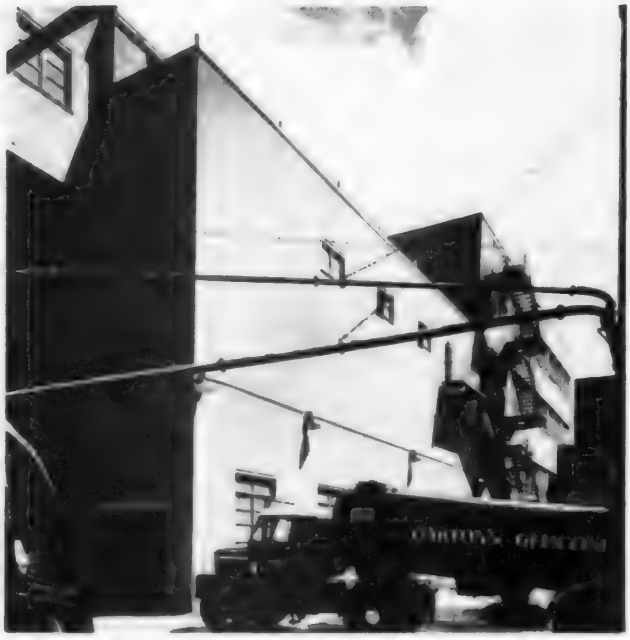
Attention is also given to the extent to which, under the varying conditions of different localities and age groups, levels are likely to have differed from the national average.

The major effort was devoted to milk, but potatoes, leaf vegetables, flour, cheese, eggs, proprietary cereal based infant foods and tea were also examined. The quantity of Strontium 90 in milk rose appreciably in the early part of 1959 with the result that the mean value for the twelve months ended June 30 was 40% greater than it had been six months earlier. Subsequently the levels decreased, and in the latter part of the year they were similar to those observed a year previously. Thus the mean value for the preceding twelve months changed little between June and December.

The country-wide mean values at the end of June and December 1959 were 11·7 and 12·2 micro-microcuries per litre (9·6 and 9·8 micro-microcuries per g of Ca) respectively. In spite of the fact that values were about 50% higher than those estimated for 1958, the estimated level in the diet of the population as a whole represents less than one-twentieth of the maximum permissible level recommended by the Medical Research Council.

The evidence suggests that the Sr 90 which has hitherto been released into the atmosphere has already exerted its maximum effect, and that decreasing levels in human diet may in future be expected.

* Agricultural Research Council Radiobiological Laboratory Report No. 3. "Strontium 90 in Human Diet in the United Kingdom." H.M.S.O., London, 1960. Pp. 58. Price 3s. 6d.



A liquid glucose container drawn up by the side of Garton's new factory building.

## *New £1 million factory development at Battersea*

# Gartons to double Glucose Output

A NEW £1 million factory development at the Battersea riverside works of Garton Sons and Co., Ltd., will double the firm's output of glucose, starches and by-products.

The firm are already producing annually well over 100 million lb. of glucose, edible starch and other by-products of maize, the basic raw material. The bulk of this output is absorbed by the confectionery and other industries. Corn steep liquor from the process has been used since 1940 as a nutrient for the preparation of penicillin.

**New building**

The factory is claimed to be one of the most modern automated plants for refining glucose and other products. The new four-storey building covering nearly 16,000 sq. ft., represents the major part of the long-term development plans for the five-acre factory site, and was opened on October 10 by Mr. Joseph Godber, Joint Parliamentary Secretary to the Minister of Agriculture, Fisheries and Food.

The new factory extension is in three main sections. At one end is the steephouse, containing large vats in which the maize is initially soaked. The centre section is known as the wetside, where grinding, screening, separating and drying take place. The third section comprises laboratories, switchrooms, stairwell, lift and cloakrooms.

(*Left*): **The tops of some of the 90-ton concrete and timber vats into which the maize is pumped from the weighbridge on the floor above. The grain soaks in water for 24 hours to soften it for the subsequent processing.** (*Centre*): **The rear of the new Dorrclone stainless steel screens for separating fibre. This installation replaces the older type of reels which were spread over three floors.** (*Right*): **Tanks and pumps for collecting the process water flowing from the fibre washing screens above.**

The weight of the ten concrete and ten timber and iron vats in the steephouse, each 12 ft. in diameter and 27 ft. high and holding 90 tons of maize and water, created special problems. As not all the vats would be empty or full at the same time, eccentric loading had to be considered; the first-floor vat room is supported on 60 reinforced concrete columns 2 ft. square and concrete beams measuring 3 ft. by 2 ft. A certain amount of initial demolition was necessary, and excavation went down to 15 ft., where water was encountered.

**Precautions against corrosion**

The special type of cement specified was imported from Belgium and is of a super-sulphated type which, although needing almost twice the amount of mixing and more time to set than normal Portland cement, is exceptionally resistant to sulphur fumes. Window frames are of teak for the same reason.

To prevent metal contamination during refining, plastic piping has been used throughout for transporting the mill flow, and has also been used for an extensive drainage system to convey waste water to an underground sump for screening and recirculation.

Floors, which have been kept clear of motors and pipes by overhead installation, are surfaced with an easily cleaned composition material. The roof is insulated with a foamed slag and asphalt.

Because of the presence of small amounts of $SO_2$ gas in the atmosphere the whole of the exposed concrete is painted with a chlorinated rubber finish and all electrical conduiting is p.v.c. coated.

**New washing and screening system**

An interesting feature of the plant is the new Dorrclone stainless steel washing and screening plant, which occupies 283 sq. ft. of floor space compared with the 4,000 sq. ft. on three floors of the old installation comprising screening reels. The new plant does the job quicker and more hygienically, besides giving more positive control.

**History**

It was in 1847 at Southampton that William Garton first began producing invert sugar for brewing. The new product was a commercial success and the firm was able to move in 1882 to its own new factory at Battersea. In 1904 production of liquid glucose was begun, and the firm began grinding maize for that purpose, claiming to be the first British firm to do so.

In 1926 the company was bought by the Manbré Group, whose members are engaged in the manufacture of refined sugars, liquid cane sugars, syrups and treacles, liquid and solid glucose, dextrose monohydrate, cornflour, adhesives, dextrins, starches and cattlefoods. The result of the amalgamation was the formation of a parent company, Manbré and Garton, Ltd.

Other members of the Group include: the Sankey Sugar Co., Ltd., Martineaus, Ltd., and African Products Manufacturing Co., Ltd., of S. Africa.

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## C.W.S. Preserve Works

(*Concluded from page* 505)

delivery area of any C.W.S. factory, and its delivery area is the whole of England south of a line drawn east and west through Birmingham, with the exception of the London area which is served by Acton.

**Some suppliers of equipment**

A.P.V. Co., Ltd.: sieving machines.
C.W.S. and W. and T. Avery, Ltd.: weighing machines.
Keith Blackman, Ltd.: jar heater.
Wm. Brierley, Collier and Hartley Ltd.: shredding machines, sieving machines.
Brook Motors, Ltd.: motors.
Dawson Bros., Ltd.: jar washing machines.
Thomas Hunter, Ltd.: capping machines.
James A. Jobling and Co., Ltd.: glass pipelines
Robert Kellie and Son, Ltd.: jam making plant, filters.
Mather and Platt, Ltd.: canning machines.
Metal Closures, Ltd.: capping machines.
The Metal Box Co., Ltd.: jam filling machines, canning machines.
Morgan Fairest, Ltd.: *Banks* labellers.
Newman Labelling Machines, Ltd.: labelling machines.
Purdy Machinery Co., Ltd.: labelling machines.

## Indoor Potato Storage

Independence of weather conditions during grading is the most obvious advantage of indoor storage and an important consideration to the potato grower. Indoor storage also ensures better working conditions and increased output. The crop can be graded and bagged in advance of requirements and all types of vehicle can approach a well-sited store however bad the weather, and often be loaded under cover. These are only a few of the advantages of indoor storage which are mentioned in a new bulletin* from the M.A.F.F.

This publication deals with the siting, design and construction of buildings, as well as with insulation, ventilation and electrical installation. There are also sections on mechanical handling and managing the crop from the time it is put into store until it is marketed. The two appendices cover the economics of indoor storage and the capacity and ventilation of storage buildings.

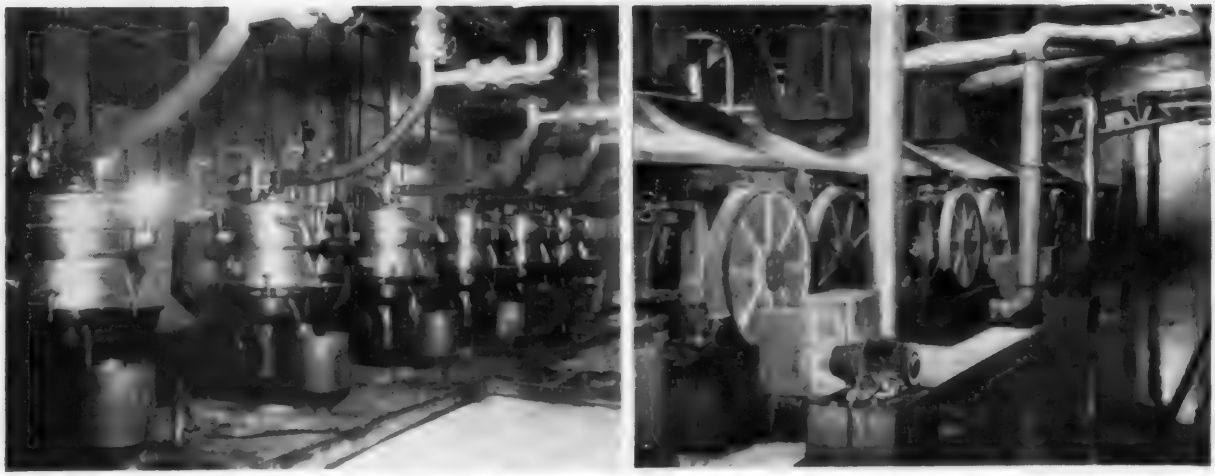
* Bulletin No. 173: *Bulk Storage of Potatoes in Buildings*. H.M.S.O., London, 1960. Pp. 35, 8 plates of photographs. Price 3s. 6d. nett.

## Dehydrated Vegetables

The Ministry of Agriculture, Fisheries and Food have now issued the second edition of a booklet* which has been written to provide a general background to the subject of dehydration, and specialised guidance to the caterer.

The new edition contains additional information about the increasing range and variety of dehydrated vegetables now available. It discusses the nutritive value of the different vegetables, the process of dehydration, buying and storing, preparing, cooking and serving dehydrated vegetables. Instructions for cooking are given as well as a synopsis of part of the Ministry's specifications for dehydrated potatoes and vegetables and for mashed potato powder.

* *Dehydrated Vegetables for the Caterer* (2nd edition). H.M.S.O., London, 1960. Pp. 20. Price 1s. 6d. nett. (1s. 8d. by post).



(*Left*): **A battery of yeast separators, which separate the yeast from the wort or wash water.** (*Right*): **These double drum dryers produce dried yeast flakes which are ground into powder.**

# A Food Yeast Plant in Formosa

By H. C. Chien*

**The drive to provide more protein for underfed peoples makes the production of yeast for food of interest, and this article describes a recently-built yeast factory in the East which produces 40 tons per day.**

LIKE many other areas in the world, Formosa (Taiwan) is deficient in the production of animal and vegetable proteins. Annual imports of milk powder and soya bean alone amount to about U.S. $12 million. The problem of increasing protein production is difficult to solve because the area of arable land on the island is limited and the population is growing at the rate of 3½% per year, an annual increase of 350,000.

Taiwan is a semi-tropical island about 14,000 sq. miles in area of which two-thirds are rugged mountains. Its population numbers ten million, and it has three to four million head of livestock, mainly pigs. Production of sugar cane and rice amount to 90% of its total crop production. Sugar contains no protein and rice not a great deal, so unless food and animal feed containing a high proportion of protein and grown at a fast rate on comparatively little acreage are produced, protein malnutrition among people and livestock will be severe.

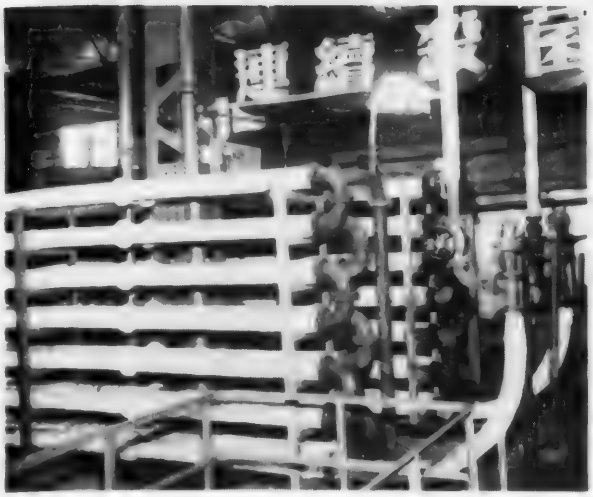
For these reasons, industrial production of primary-grown yeast by modern methods has been established on the island. For a long time yeast has been known to be a valuable source of proteins and vitamins of the B complex. Plants for producing it were built in Germany during the war, and more recently in U.S.A. and other countries.

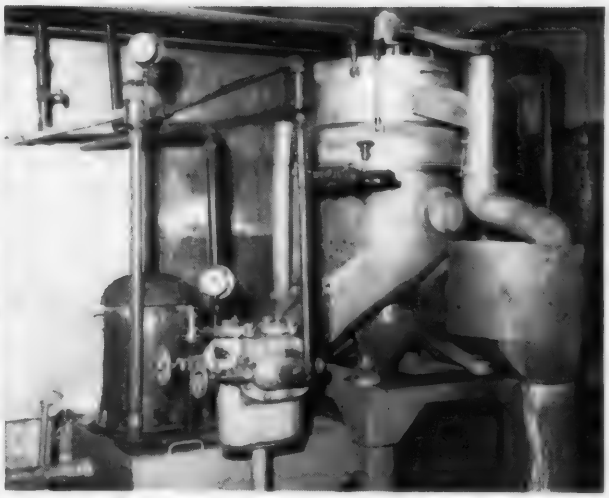
The yeast cell is a self-sufficient living organism which produces enzymes, vitamins and growth factors. For several reasons its production for food is an attractive proposition. First, yeast grown in a factory produces a thousand times more protein than any farm crop per acre of ground space. Secondly, its rate of growth is rapid, the weight being doubled every three to four hours. Thirdly, yeast is remarkably efficient in converting inorganic nitrogen into edible protein. Fertilisers added to the soil are partly absorbed by plants, partly retained in the soil, partly wasted by weeds and partly washed out by rain. But yeast converts nearly 90% of the inorganic nitrogen used to feed it into edible protein.

### Use for molasses

The idea of producing yeast in Taiwan first arose in 1955, when a group of biochemists and engineers thought that if a yeast factory could be built it could fulfil part of the island's protein requirements. The factory could also help solve the problem of profitably utilising the island's annual production of blackstrap molasses, which often sells at depressed prices. About 30 million gallons of blackstrap are produced annually as a by-product of the

* Manager, Hsin Ying Yeast Factory, Taiwan Sugar Corporation, Tainan, Taiwan.





(*Left*): **The flash steriliser which kills micro-organisms in the diluted blackstrap molasses.** (*Right*): **The molasses is clarified in this high-speed centrifuge.**

sugar cane industry on Taiwan.

Economic considerations favoured the building of such a factory by the Taiwan Sugar Corporation, a government enterprise. The corporation owned an idle alcohol distillery which could be utilised, and the siting of the yeast factory at the source of the major raw material, blackstrap molasses, would save transport and overhead costs. The corporation already owned 35 food and industrial factories processing sugar, alcohol, edible oil, antibiotics, pineapple and bagasse board. The factory would have an assured market for a large part of its production because the corporation had a need for high-quality mixed feeds for its own 40,000 meat-type hogs raised annually. It could also distribute part of its production to local farmers through the government's supply bureau.

The corporation also had the great advantage of possessing large research laboratories where over 100 specialists are employed on research problems concerned with cane sugar production, the utilisation of cane by-products, and fermentation. Research costs are low compared with the gross annual sales of the corporation, which amount to over U.S. $100 million. These research facilities continue to supplement the specialised research and quality control laboratories established at the yeast factory when it was built.

**Modern factory built**

Therefore a modern Torula yeast factory with a capacity of 40 tons of dried yeast per day was designed after a careful study of several existing factories in Europe and U.S.A. and after conducting fundamental research to improve the process. The plant was constructed at Hsin Ying during 1955 and 1956 by Chinese engineers at a cost of nearly U.S. $2 million. It went into full-scale production in 1957. Improvements to process and equipment were completed in 1959. These improvements were necessary because the new factory was larger than previous installations and a need for improvements such as increased aeration and cooling was revealed.

The raw materials now being used are cane blackstrap molasses, urea, ammonium sulphate, superphosphate, air and water.

In this new plant the following equipment was installed:

(*a*) molasses purifying units, including dilution tanks, continuous flash steriliser and centrifugal clarifiers;

(*b*) water pumping and purifying system;

(*c*) air pumping and purifying system;

(*d*) six yeast propagators, 28 ft. in diameter and 15 ft. in height with necessary temperature, *p*H and flow-rate control instruments;

(*e*) three sets of refrigeration equipment;

(*f*) eighteen yeast separators;

(*g*) six double drum driers;

(*h*) blending equipment for mixed feeds and other products;

(*i*) automatic weighing and bagging equipment.

**The process**

The blackstrap molasses is measured, diluted to a definite Brix, sterilised through a continuous flash steriliser and clarified through a high-speed centrifugal clarifier.

The water is purified by passing it through a series of sedimentation ponds and filter ponds and a sterilising tank.

The air is taken in from the outside of the building by high speed suction fans, compressed and passed through a series of cotton filter tanks.

The cane molasses and the other ingredients—including urea, superphosphate and ammonium sulphate, air and water—are fed continuously into the yeast propagators. The yeast wort, which contains about $\frac{1}{2}$ to 1 million cells per c.c., is drawn continuously from the propagators.

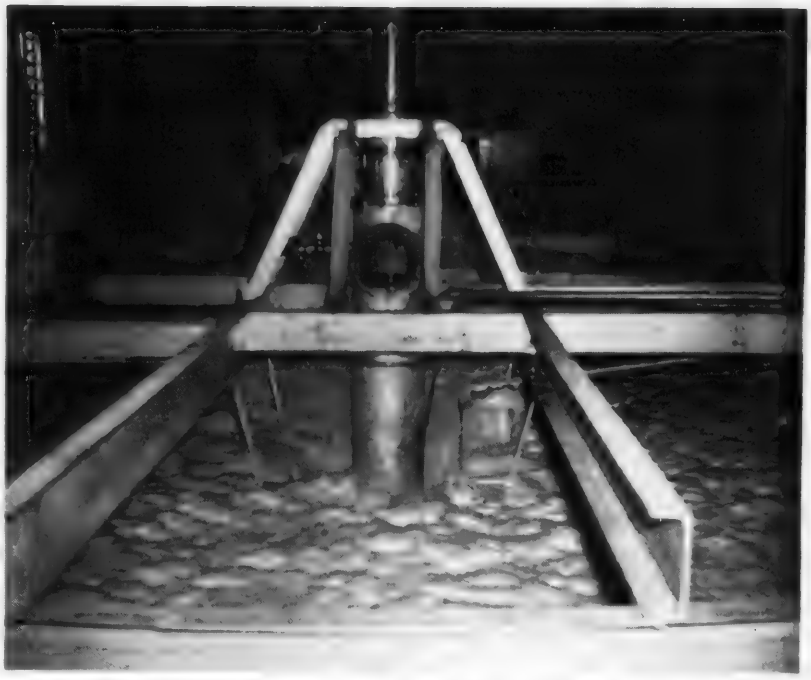
The heat generated by the growth of the yeast in the propagators is removed in heat exchangers by being absorbed into chilled water pumped from the refrigerating units. The warm water from the heat exchangers

goes to the refrigerating units and final heat is removed by spray cooling pond and cooling tower. During the cooler season, the refrigerators are by-passed.

Yeast wort is concentrated by passing it through yeast centrifugal separators. The concentrated yeast is washed in clean water and reconcentrated in the separators. It is dried on double-drum dryers. The yeast powder is screened and blended in special equipment.

**Quality control**

Rigid laboratory control is of prime importance at every stage in the manufacture of quality yeast. The clarification of the cane blackstrap molasses by a high-speed recycling centrifuge ensures a lighter colour and better taste of the yeast. As stainless steel equipment is used for all the processes in this plant, the *p*H of the wort can be kept low to protect the yeast against contamination by undesirable micro-organisms and by coloured materials. Temperature regulators control the temperature of the yeast wort. A check on the yeast population and the condition of the cells in the propagators is continually maintained by microscopic examination of samples. Vitamin content is checked by spectrophotometer.



**One of the six yeast propagators, each of which has a specially designed agitator to control foam.**

The dried yeast is packed in powdered and flake form in bulk steel drums, in multi-wall paper sacks, in consumer-size packs, and pressed into tablets for easy eating.

**Yeast products**

Because Chinese foods are mostly home-made and very little is manufactured in factories, food yeast has not yet been extensively used in food manufacturing on Taiwan. Most of the 40 tons per day produced by the factory is used in animal feed. Nevertheless, several yeast products for direct human consumption are being produced in the Hsin Ying yeast factory and by other food manufacturers.

One product is yeast tablets coated with sugar; the consumption of these on Taiwan is about one ton per day.

Another food product which contains yeast is "Nutritive Wheat Flour" in which 2% of dried yeast powder is blended with the wheat flour. This yeast enriched flour is distributed on the local market to consumers and to food manufacturers.

Another yeast product is yeast autolysate which has a meat-like flavour; it is used for making soup and in other food products.

Another new product is the granules of solvent-extracted soya bean flour and yeast. These granules are used as an ingredient for making soy sauce by fermentation and by acid hydrolysis. The yeast increases the content of

(*Concluded on page 526*)

**A spectrophotometer in use in the quality control laboratory.**

# *1860 Act was not "utter failure"*

SIR,

I was delighted to read Dr. Burnett's article in FOOD MANUFACTURE, because Dr. Burnett brings out several points which have been largely omitted by all participants in the Pure Food Centenary Celebrations.

Those present at the meetings at the Royal Institution will remember that Dr. Whittet was anxious that more attention should be paid to the work of Dr. John Postgate in promoting the first Act for preventing the adulteration of food, and I feel sure that we are grateful to Dr. Burnett for stressing this. On the other hand the statement that the first Act was an utter failure is rather sweeping. At times Local Authorities have brought actions under the Food and Drugs Act, especially during the last war, expecting to lose them, but doing so in order to obtain publicity with a view to the promotion of amending legislation. The expression that one can "win the war and lose the peace" is a well-known one, and one need only refer to one of history's greatest failures, the Death on the Cross, to realise its effect on humanity at large. If only in this spirit, therefore, the celebrations of the first Act were more than justified.

There were probably many reasons, apart from those generally put forward, why the first Act was a failure. It was purposely framed to permit local people to be appointed as analysts or "analysers" as they had been called in the Report of the Select Committee. Many of the first analysts were the local medical officers of health, who were more preoccupied with their other work. One great failing in the Act, however, was that that the appointments and removals of public analysts required the approval of the Secretary of State. It was unnecessary for a local authority to appoint a public analyst, but if they decided to do so, it was necessary to obtain the approval of the Secretary of State both to his appointment and to his dismissal. Was it surprising that local authorities decided not to make the appointments in the first place?

The build up of the British constitution has been such that the Select Committee had recommended that the enforcement of the Act must be in the hands of the local authorities and now they were to be hampered. The Committee had even suggested that local Boards of Health should be empowered to forbid the use of colouring or mineral matters, or poisons in foods. (Report, p. viii.) When it is remembered that Dr. Letheby, the public analyst for the City of London, was also the Medical Officer of Health for the City, if he could not use influence, who could?

Dr. Burnett further suggests that the co-operative societies enabled the middle classes and those of the working classes, who could escape from indebtedness to join them, to obtain pure food, but on what evidence he does not state. In the Report of the Select Committee it is made clear that the co-operative societies were composed mostly of working people and it has been this class snobbery, which has for years militated against many middle class people joining co-operative societies.

No, Sir, the 1860 Act did not pass into the Statute book and oblivion. In 1868 the "Sale of Poisons and Pharmacy Act Amendment Act" (Section 24) brought drugs under the provisions of the 1860 Act, and in 1872 the "Act to amend the Law for the prevention of Adulteration of Food and Drink and of Drugs" was passed as a preliminary to the setting up of another Select Committee to report on the position, which resulted in the "Sale of Food and Drugs Act," 1875. Frequently one is angered by frustration, and as a public analyst I would not claim to be exempt from such temptation, but, if we look at history as a whole, we can see and take pride, or otherwise, in its development.

THOMAS MCLACHLAN.
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London, W.1.

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### *How ugly can you get*

SIR,

Noting your editorial comments in October on food processing glamour, though it is obviously true that machines should first of all be "efficient, quick and of use to the processor," a plus factor comes from their having an attractive appearance, even artistic, if that is possible from the average English Philistine in these matters.

Like myself, many of your readers will have visited Italian food and other factories to experience the pleasing combination of efficiency and artistry often to be found. It is, of course, the delicate matter of taste to decide how far to go, but a stodgy-looking machine is likely to be associated with the stodge that it is processing.

Though we agree the folly of tinsel-like glamour, may we at least be spared the sight of the type of food machine monstrosity featured in the early sequences of the film "I'm All Right, Jack." "Farina-ceous" machines would be more welcome both in fact and in advertising copy.

R. J. CLARKE, M.A. (Oxon.),
A.M.I.Chem.E.
Edgbaston,
Birmingham, 15.

# MACHINERY and EQUIPMENT

### CARTON-ERECTING AND CLOSING

New high-speed machinery for use with the company's *Diotite* packaging system has been developed by The Metal Box Co., Ltd. The new erecting machine, the *Diotite S.51*, has twin heads and can handle a range of cartons in sizes varying from 3 in. × 3 in. × ¾ in. to 9 in. × 6 in. × 2 in., at a speed of over 150 cartons a minute. Change-over of carton sizes, it is claimed, takes less than an hour.

The closing machine, the *Diotite C.51*, operates on a rotary principle and has a specially designed feed to enable cartons to be fed at random. Cartons are pushed up into a heated pocket, and the three side flaps are folded down and sealed simultaneously. The new high speeds have not necessitated any alteration in the existing *Diotite* carton designs, which need neither inner bags nor overwraps, are available in top-opening and end-opening styles, waxed or polythene lined, and are supplied by the company's Paper Group.

### AUTOCLAVES

An *Atmos* smoking and cooking oven made by Mittelhäuser and Walter has recently been installed by Sainsbury's. This firm manufacture a range of autoclaves and say that among the advantages of this range are that they can be installed without special foundations or a pit, simply on the existing factory floor. Other advantages are a quick-locking device which is said to be accident-proof and gives easy and quick opening and closing of the lid, and easily-handled can container trolleys which are placed inside the autoclave. There is a single central control lever for all steam and water valves, pumps and rotor: one complete turn of the switch lever on the control dial, controlling five operations, effects the total process of sterilising and cooling. Units are completely enclosed, and the upper boiler is insulated to avoid heat losses. The *Rotor Twin* Autoclave type 11/1100/2 has two lower boilers of 1,100 mm. diameter, each of which can accommodate two can containers: the *Hansa* Rotor Over Pressure autoclave type 1/900/3, with one lower boiler of 900 mm. diameter, has a capacity of three can containers.

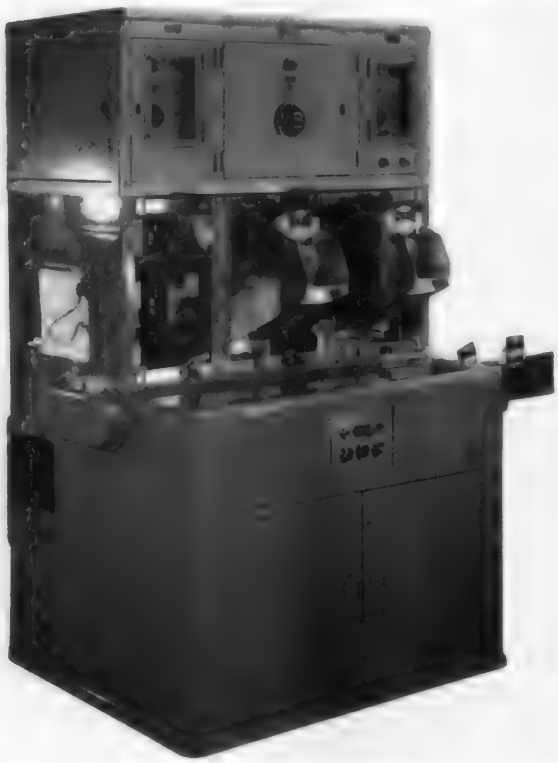
### AUTOMATIC BOTTLE LABELLER

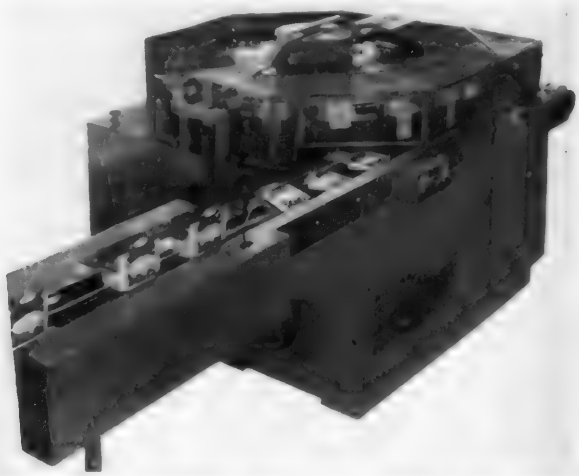
The *Banks* range of automatic labelling machines produced by Morgan Fairest, Ltd., includes the *Cyclone* flat machine, specially designed to apply a maximum sized label of 5 in. wide by 6 in. deep to the front face or three sides of a flat, square or oval bottle. Bottles, in a vertical position, pass straight through the labeller at a continuous uninterrupted speed. A "no bottle-no label" device, mechanical overload and infinitely variable speed are incorporated, and an automatic dating attachment can be fitted. The base of the machine covers an area of 52 in. by 45 in., and is compact in design and simply installed into any production line. The machine, which is sold complete with motor drive and vacuum circuit enclosed in the fabricated steel body, has a maximum speed of 120 b.p.m.

### VOLUMETRIC FEEDER

A new precision method of metering dry materials, by means of the *Vibra* Screw Feeder, has been developed by Simon Handling Engineers, Ltd., and Henry Simon, Ltd. The feeder incorporates a screw mounted on a vibrator in such a way that the screw, screw trough, screw bearings and discharge tube vibrate as one assembly while the screw rotates. Feed rates are proportional to the speed of rotation of the screw, and are infinitely variable over a range of approximately 50:1.

The standard range of feeders consists of ten graduated sizes with screws ranging from ½ in. to 4 in. diameter, providing feed rates ranging from a few ounces to tons per hour. The vibratory action is claimed to overcome sticking, bridging and flooding, and to maintain a constant level of material over the screw to eliminate feed rate fluctuations. The controlled vibration is said to ensure exceptional accuracy by eliminating aeration, and deviations for most materials are kept to within ±1 to 2% minute to minute. Designed to handle fine powders, flakes and pellets





**New high-speed machines developed and built by Metal Box for its "Diotite" packaging system. (*Left*): The S.51 twin-head erecting machine for "Diotite" cartons. (*Right*): The C.51 rotary closing machine. These machines were displayed at the National Frozen Foods Exhibition in New York recently.**

and delicate crystalline materials, the standard machine construction is mild steel with the screw and discharge tube of stainless steel, but aluminium and plastic finishes can also be supplied.

**Simon's "Vibra" screw conveyor meters dry materials over an infinitely variable speed range of 50 : 1.**

### HIGH-SPEED BAG PACKER

Thomas Robinson and Son, Ltd., have recently produced a new high-speed packer to handle, among other things, open-topped multi-wall paper bags in the 50 to 150 lb. range. The electro-hydraulically operated machine, designed by the firm's Australian associate company, is normally installed on two floors, the weigher being mounted on the floor above the packing and sewing section. Recent tests carried out with flour have achieved speeds of 8 bags/min. with 70 lb. bags and 6 bags/min. with 140 lb. bags. Packing density is adjustable, to enable a loose and tight pack to be produced, and the stainless steel packing tube is easily changed to accommodate different bag sizes.

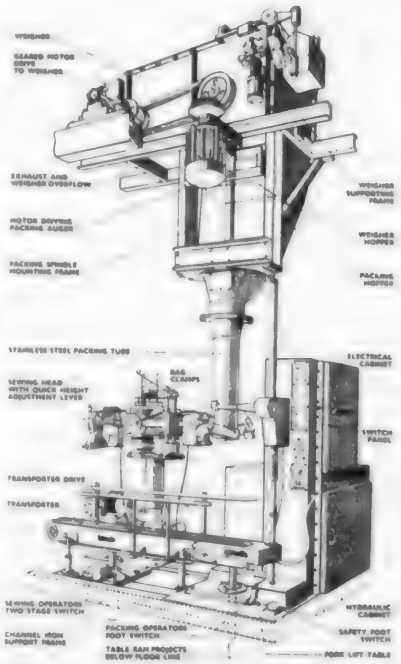
### PROTECTIVE TAPE

Nearly two years' intensive development work, say the makers, was necessary to ensure completely satisfactory results from a new Vinyl Protection Tape which has just been added to the *Sellotape* range. The wide range of surfaces to which this can be applied includes polished steel, polished aluminium, anodised aluminium, mild steel, lacquered or painted metals, decorative and industrial plastic laminates, porcelain, glass and some polished wood surfaces.

This transparent unplasticised Vinyl film, giving a good measure of pliability, is coated with a special low tack adhesive designed to give both ease of removal from all surfaces and long application life. The tape is not intended to give absolute protection against severe wear and tear and abrasion, but to provide a barrier against scratches, disfiguring marks and scuffing which would make many polished or decorative surfaces unsuitable without expensive refinishing.

The Vinyl film is claimed to be fully water and moisture-vapour proof and to exhibit a high degree of resistance to attack by chemicals, thus offering an all round protection hitherto impossible with conventional tapes.

*Sellotape* Vinyl Protection Tape is available in the U.K. only in rolls of 100 yards and 360 yards, widths up to 24 in., from Gordon and Gotch (Sellotape), Ltd.



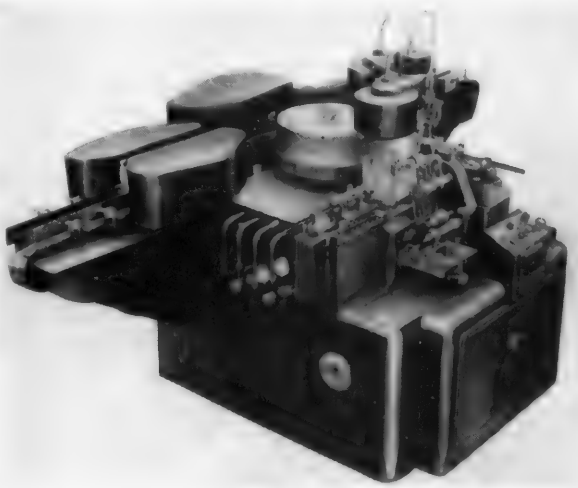

*(Above)*: **A drawing of the Robinson high-speed bag packer.**

### REFRIGERATED VEHICLES

Two refrigerated bodies have recently been built by Mann Egerton and Co., Ltd., on Thames Trader 7-ton chassis for Messrs. T. Wall and Sons (Meat Pies and Handy Foods), Ltd. The vehicles are designed for carrying meat products at temperatures around 30°F. Forced convection refrigeration equipment is fitted. They are equipped with double roller tracks so that pallets can be easily loaded and off-loaded.

### BAKING CONTROLS

A fully-automatic spray greasing unit which overcomes the problem of greasing bread tins has been developed by British Bakels, Ltd. Used in conjunction with the company's own *Tincol* greasing emulsion, the unit automatically greases dough pieces instead of the tins. Dough pieces travel along the conveyor and enter the automatic greasing unit, where they are detected by a light beam which switches on a spray gun designed to spray the dough piece with a fine, correctly angled spray of *Tincol*; as the pieces pass the light beam the spray gun is automatically switched off. A pressure tank is supplied with the equipment, and this is normally situated under the conveyor belt, leaving only a small compact unit for mounting on the conveyor. The photo-electric light beam controlling the operation is of a high sensitivity and, it is claimed, is not affected by grease being sprayed on the



**The "Cyclone" flat automatic labelling machine is the latest addition to the Banks range and labels flat, oval or square bottles.**

optics of the projector and receiver. Some installations incorporate time delays, and an electromagnetic counter can be fitted, operating from the same contacts, if required. The unit is designed to handle dough pieces from 4 oz. to 4 lb. in weight at any speed from 1 to 60 pieces/min.

### FEED CONVEYOR

A unit developed for feeding rigid containers to weighing and filling machines has been produced by Autopack, Ltd. Equipment is included for accurate positioning beneath the discharge nozzle during filling, and no discharge can take place until the container is in the correct position: electrical control gear is incorporated for coupling to the weighing or filling head for timing purposes. The equipment can be combined with precision fillers, and has a wide variety of applications. It is most suitable for handling tins, bottles, vials and composite drums.

### FLEXIBLE DOORS

A new idea from Minikay, Ltd., is a "stable-type" flexible door known as a *Minidoor*. It is claimed that satisfactory temperature control can be achieved in chill-rooms at temperatures of 32°F. and above without the need for full-height flexible doors. The new type door permits unimpeded visibility over the top of the door, facilitates mechanical handling, and eliminates the nuisance of deterioration or misting-up of observation panels in full-length doors. The hinges are well out of the way of the actual doorway, reducing the risk of damage by badly steered trucks, yet they permit 180° operation of the door.

### ONE HAND CARTON CLINCHER

A new *International* one-hand clincher produced by Benrose Stapling, Ltd., is specially designed for one-handed operation. Claimed to be a faster, more accurate and less fatiguing method, the clincher is designed to operate in restricted areas and to staple cartons of unusual shapes. The hand lever operates a two-piece retractable anvil which penetrates the carton flaps, and driving blades push the staple downwards to a controlled and adjustable depth, whatever the thickness of corrugation. Pneumatic models are also available for single and dual stapling.

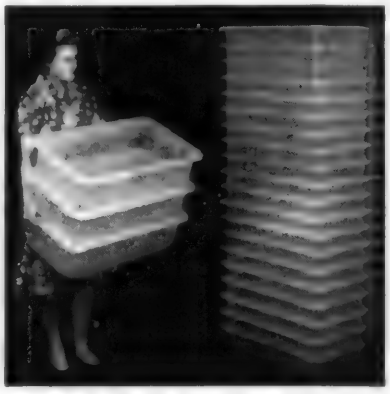
### BIN LEVEL INDICATOR

A range of bin level indicators produced by Magco, Ltd., incorporates the minimum number of parts. A plain main casing is surmounted by a flexible diaphragm, the movement of which operates a microswitch within the case, giving maximum sensitivity and enabling the indicator to be installed at an angle, if required, without internal adjustment. Singly, the unit indicates a specific level, and will give either visual or audible warning. Used in tandem, it can be made to give automatic control of a filling cycle. Indicators are also suitable for hoppers under internal pressure or vacuum conditions. Three standard sizes are available, the 6 in. diameter for use mainly on worm conveyors and small hoppers, the 8¾ in. diameter for use where material does not exceed about 2¼ in. mesh, and a 10¼ in. model for larger material.

**These "Minidoors" are claimed to be more economical and just as efficient as full-length doors for chill rooms, with the added advantage that visibility over the top is unimpeded.**

### FLASH DRYING SYSTEM

A flash drying system designed to remove a specific amount of moisture from damp granular or fibrous material has recently been introduced to the U.K. by International Combustion Products, Ltd. The *Raymond* Flash Drying System is designed to accomplish drying under three different conditions: drying without distintegration, drying with disintegration and drying and pulverising. The material is circulated in a hot, turbulent gas stream, causing rapid transfer of heat and evaporation of moisture. A distintegrator or pulveriser is included in the system when simultaneous drying and grinding is required, and the finished product is separated, cooled and conveyed in a dust-free plant operating under suction. Dryness and particle size can, it is claimed, be accurately controlled. Hot gas is supplied either by direct firing, indirect heating or the use of waste gas.

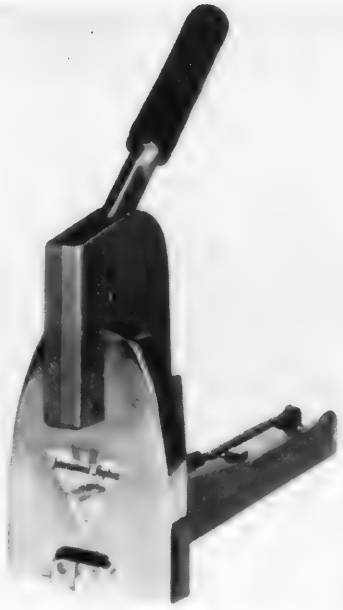


**These sterilisable trays are the first to be made in this country of polypropylene. Makers are White, Child and Beney.**

### STERILISABLE PLASTIC CONTAINERS

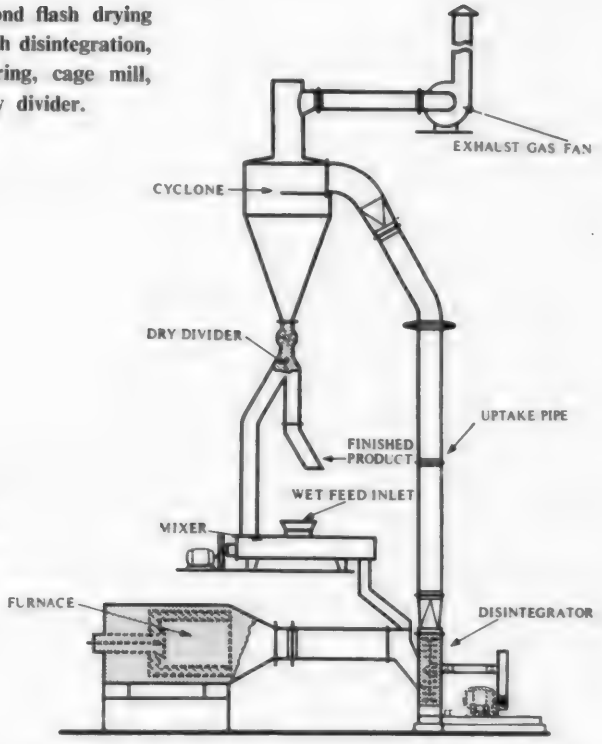
A new range of sterilisable polypropylene trays, said to be the first of their kind produced in the U.K., is being manufactured by White, Child and Beney, Ltd. This material, similar in appearance and chemical resist-

**The Magco bin level indicator.**



*(Left)*: **This International one-hand clincher can be used in restricted places.**

*(Right)*: **The Raymond flash drying system for drying with disintegration, showing direct oil-firing, cage mill, mixer and dry divider.**




ance to polythene, will withstand temperatures up to 300°F., and is not affected by boiling or other high temperature sterilising. The range will include nesting, stacking and plain trays up to approximately 36 in. square. Additional characteristics of these polypropylene trays are rigidity without weight, resistance to staining, good impact strength, a smooth surface with exceptional resistance to abrasion and a high load carrying capacity.

## CARTON WRAPPING MACHINE

Latest addition to the extensive range of film-wrapping and heat-sealing devices made by British Cellophane, Ltd., is the Multi-Packaging Aid, thought to be the first of its kind in the world. Designed to facilitate manual multi-packaging (or "parcelling") of cartons and other regular-shaped containers in *Cellophane* firm, the Multi-Packaging Aid is especially suited to the needs of manufacturers and packers whose circumstances do not warrant the installation of automatic multi-packaging machinery. It consists, basically, of a 22½ × 18 in. metal platform, on which is mounted a pair of brackets supporting a pivoted sealing-bar assembly. The sealer—at the far end of the platform, as the operator faces it—is raised well above the platform when not in use, allowing completely free movement there. It is 16 in. long and has two independent sealing faces.

The sealer is activated by moving the assembled multi-pack forward on the platform, to make contact with a pressure plate. This in turn acts against a pressure bar on the assembly and swings the sealer down to make a longitudinal seal on top of the multi-pack. The pressure plate also helps to ensure correct alignment of the components of the pack.

The ends of the pack are sealed by brushing the end-folds against the second sealing face of the bar (which faces the operator) with the assembly raised. This involves lifting the multi-pack, and can only be done where the pack is relatively small and light, or operator-fatigue will result. Larger, heavier packs are sealed by means of a separate end-sealer (supplied as an accessory).

Both sealers are adjustable by means of wing-nuts, and the aid will accommodate packs up to 15 in. long, and between 4 and 9 in. wide and 3 and 7 in. high. (Multi-packs less than 3 in. high can also be wrapped if they are placed on a suitable mounting block during the longitudinal sealing operation). Sealing temperature is regulated by a thermostat, conveniently housed underneath the platform.

An output of approximately three packs a minute is claimed for the aid, with very little operator-training.

**This multi-packaging aid made by British Cellophane is the latest addition to their range of film-wrapping and heat-sealing devices.**

### Cushioning effect with polythene film

A polythene film incorporating an air cushioning device is *Fablothene Air-wrap*, produced by Anglo-American Plastics, Ltd., who also supply *Fablothene* polythene bags in a wide variety of styles and printed to any design.

The film is available initially in a width of 50 in. and incorporates twelve completely independent air cushions to each square inch of film. It is suitable for lining soft fruit cartons, for interleaving in chocolate boxes, and for packaging delicate items.

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### Polythene screw stoppers

Polythene screw stoppers for beer and mineral waters are now being made from *Rigidex* high density polythene made by British Resin Products, Ltd. They are non-toxic, non-porous, resistant to acids and alkalis, and are claimed to be virtually unbreakable and unchippable. They can be sterilised at 100°C. and can withstand the pasteurising process without loss of pressure within the bottle.

The tops can be fitted with a coloured insert, making possible identification of individual products. The coloured inserts can be produced with a trade mark or motif moulded in relief. The stoppers are produced with beaded or straight shoulders, and are fitted with red rubber rings.

Although slightly more expensive than their ebonite counterparts, the new stoppers are claimed to be economical on account of their long service life; when they require replacement, the manufacturers offer a rebate on worn stoppers.

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### Colour-printed salt pack

Salt in colour-printed *Cellophane* film bags is proving a best-seller for the Doncaster Co-operative Society. After twelve months of retailing table salt in transparent packs they report "vastly increased sales." Previously paper sachets were used.

The bags of moistureproof film sealed by pressure-sensitive tape measure 9½ × 3 in. with 1 in. side gussets. They are printed on the face and sides in blue, white and orange with the weight (1½ lb.), description of the contents and the Society's symbol. The design conforms to the Society's current house style, and the pack is in line with similar packs for cereals and dried fruits.

In addition to displaying the whiteness of the contents to advantage and catching the shopper's eye with its sparkle, the film gives protection against moisture. Makers are British Cellophane, Ltd.

**This table salt pack is in colour-printed "Cellophane" and is sealed with pressure-sensitive tape.**

**These stoppers for beer and mineral water bottles are made from "Rigidex" high density polythene and incorporate coloured inserts for easy product identification.**

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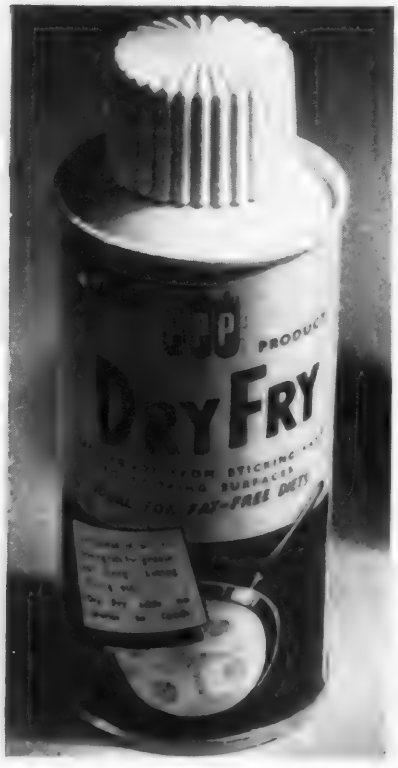
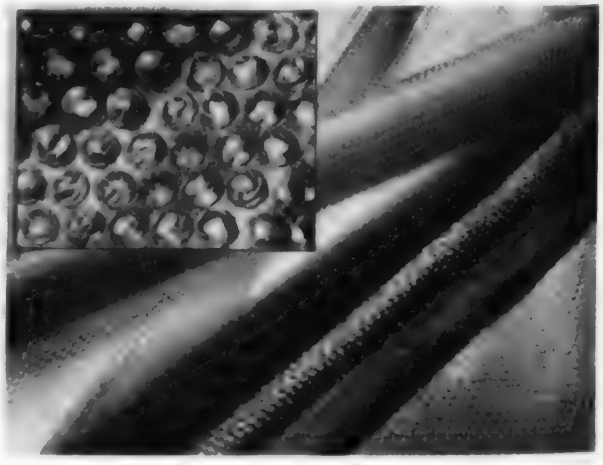
### New uses for foil pouches

A modified form of the traditional druggist's fold may lead to the use of aluminium foil pouches as a cheaper alternative to collapsible tubes, and



***(Left):*** **This Metal Box aerosol pack containing "Dry Fry" is the first aerosol food product to be made in this country. The 6 oz. container is decorated in four colours using offset printing.** ***(Right):*** **"Fablothene" polythene film which incorporates 12 air cushions per sq. in.**

*Starpacks winners. These packs won awards in the Retail Consumer Packs section of the first comprehensive British national packaging exhibition recently held by the Institute of Packaging, in which 171 entries were received.* (Left): *These laminated packets for Heinz soups, and* (centre): *these laminated packets for Batchelors soups, won Gold and Silver Stars respectively for the Metal Box Company.* (Right): *A bronze star was won by Clayton Brothers for this reeded pint bottle for mineral waters.*

may also give them an advantage over boilable plastic containers for prepared foods.

Heat-sealed pouches closed in this way are suitable for cook-in packs designed to withstand the fierce heat of electric toasters and ovens. Key to this method is that the druggist's fold—a fold upon a fold closure which in section resembles a pair of hooks—enables the heat-seal coating to be applied to the outside of the pouch. This means that the inner surface can be treated with anti-corrosive coatings or inert films which cannot normally be heat-sealed. In addition it avoids the risk, when cook-in-package foods are pre-prepared at severe temperatures, that the thermoplastic coating will decompose and leach into the contents.

Two further advantages of the fold are that it adds rigidity to the edges of the pouch and occupies no space on the inside, making the inner and outer measurements identical. Reclosure by folding is both simple and adequate for most purposes.

Milprint, Inc., adapted the druggist's fold for their new *Toaster-Redi* pouch, using fully-annealed 0·038 mm. gauge foil with a gravure-coated outer surface. It is claimed that the pouch is the closest thing to a collapsible tube that exists in the flexible packaging field.

Further information on aluminium foil pouches can be obtained from Fisher's Foils, Ltd., and Venesta Foils, Ltd.

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### Foil packs for mustard

Many railway refreshment rooms operated by British Transport Catering Services are now providing individual tear-open foil sachets of mustard, made from a foil laminate supplied and printed by the Robinson Waxed Paper Co., Ltd. The material is a triple laminate, consisting of *Visqueen*, foil and glassine, and the sachets are made up so that the *Visqueen*, which has heat-sealing properties, is on the inside.

The material is supplied by RWP in reel form suitable for Hassia and Ivers-Lee automatic packaging machines. The sachets are heat-sealed along all four edges, with a marked spot for easy opening.

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### New style flour bags

Claimed to be revolutionary, a new flour bag is now being used by James Neill, Ltd., College Place North, Belfast, for retail packing five types of flour — stoneground *Wheatmeal* and *Wholemeal* flours, self-raising soda bread, and self-raising and plain flours.

The bags, which are designed and produced by E. S. and A. Robinson, Ltd., are made from cellulose film lined with bleached kraft. They are made in two sizes—$4\frac{1}{2} \times 2\frac{1}{8} \times 12\frac{1}{8}$ in. for the 3 lb. bags, and $3 \times 2 \times 9$ in. for the 1 lb. bags.

The attractive and colourful design used for each type of flour is printed on the underside of the cellulose film, so that the film itself gives the printing a high gloss and prevents it becoming scratched during handling.

The combination of cellulose film and kraft paper gives the bags sufficient rigidity for handling on automatic filling and packing machinery.

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### Self-adhesive bands

C.W.S. of Manchester are using *Seal-Easi* self adhesive bands to make up their bargain pack of biscuits. The bands are very suitable for use with such offers where two or more packs have to be banded together. The bands are sealed without gum, heat or moisture being used; a pressure applied to the two latex surfaces is enough to give an instant and secure seal. They are available in a wide range of sizes, printed to customer's orders. Makers are John Dickinson and Co., Ltd.

*The new "Polpak" carry-home turkey pack, made for Yorkshire Turkey Packers, Ltd., by Reed Corrugated Cases, Ltd., is an attractive box, in three sizes, which will hold oven-ready birds of from 5 to 15 lb. The turkeys are vacuum sealed in a moisture and air proof wrapper and packed in wood wool.*

# ADVANCES in FOOD TECHNOLOGY

**BEVERAGES**

### *Preparation and control*

Research workers at the Institute for Food Chemistry at Budapest University have carried out an extensive research programme concerning the best methods of using home-grown produce for the large-scale supply of non-alcoholic beverages to canteens, kindergartens, etc., in Hungary. The juices of sauerkraut,* carrots, black-currants, apples, morello cherries and tomatoes, were found to be excellently suited. All these juices, separately and mixed, as well as certain branded juices on the Hungarian market were examined for tastiness and vitamin content. The refreshing effect of such juices is directly related to the *p*H value. The best organoleptic qualities are ascribed to a mixture of sauerkraut* and tomato juice, which also has a high vitamin C content. As regards carrots, a mixture of carrot and black-currant juice was found to be particularly good. As sauerkraut* and carrots are plentiful in Hungary, they can be used for the manufacture of healthy low-cost beverages.—E. Szilas and A. Berndorfer, *Industries Alimentaires et Agricoles*, 1960. **77**, 373.

*(Translator's note: the sense implies that "sorrel" is intended rather than "sauerkraut.")

**MEAT PRODUCTS**

### *Shelf-life of Frankfurter type sausages in transparent wrappings*

The increasing popularity of meat products sold in transparent wrappings is mainly due to the obvious hygienic advantages. But it is also often assumed that such wrappings can prolong the durability of the goods. In order to obtain scientific data on this subject, the Institute for Food Hygiene affiliated to the Free University, Berlin, has tested Frankfurter type sausages, wrapped in *Cryovac* and *Cellophane*, for keeping quality at room temperature and refrigerator temperature. Changes taking place during storage were found to consist in the emergence of liquid and in souring, caused by micro-organisms (mainly lactobacilli and streptococci) multiplying rapidly in that liquid. Products stored at room temperature were found to keep for three to four days only whilst *Cryovac* wrapped products stored at refrigerator temperature kept for eight days, and *Cellophane* wrapped products for 12 to 14 days. It is therefore recommended that sausage products in transparent wrappings of this kind should be kept in cold storage, and not longer than six days, and that the products should be clearly labelled as perishable. The degree of perishability is greatly affected by hygienic conditions during packaging, which should therefore be carefully watched. M. Lerche and D. Grossklaus, *Die Fleischwirtschaft*, 1960, **12**, 538.

**IRRADIATION**

### *Spices and teas*

Spices are known to be contaminated to varying degrees with mould spores, yeasts, bacteria and sometimes with insects. This contamination represents a potential source of trouble when the spices are incorporated into food preparations such as sausages and other ready-to-serve meats. To eliminate this possible cause of spoilage raw spices are generally treated to reduce the microbial and insect content. Radiation treatment seemed to be worthy of study as a possible alternative to other methods. The effect of a dose of 2 megarep of irradiation from a resonant transformer electron beam generator on the content of bacteria, yeasts and moulds of oregano, sweet basil, sage, allspice, cinnamon, cloves, ginger, nutmeg, black and cayenne peppers, chili powder and paprika was shown to be quite striking. The microbial populations of the products were completely eliminated or reduced to insignificant levels. Some effects of the irradiation treatment on the odours and content of volatile reducing substances are discussed and exemplified. In the few products studied there was a noticeable change in the type of odour complexes noticeable sensorily and in their content of VRS.—P. A. Lerke and L. Farber, *Food Technology*, 1960, **14**, 266.

**FREEZING**

### *Temperature tolerance of bacteria*

Bacterial counts on 18 lots of peas, beans, cauliflower, and spinach were followed during experimental exposures to temperatures ranging from −10° to 40°F. Taste tests were also carried out after these treatments. Average initial (−20°F.) count for the different lots ranged from below $10^5$ to over $10^7$ bacteria per g. Within lots, counts on different packages differed by as much as 50-fold. Peas were much more variable in this respect than the other vegetables. At temperatures of −10° to 20°F., bacterial growth never occurred, but large numbers of bacteria always survived prolonged storage. On a percentage basis, survival was extremely variable but averaged around 50% and only once fell below 10%. Flavour deterioration occurred in this temperature range and thus could not have been caused by bacterial growth. Bacterial growth always took place at temperatures of 25°F. and above. The population doubled in 1 to 8 weeks at 25° and 30°F., and in less than a week at 40°F. Growth can continue to the point of bacterial spoilage at these temperatures. Off flavour was detected, however, before the bacterial count had increased significantly. Thus, initial development of off flavour appears to be unrelated to growth of bacteria.—H. D. Michener, *et al.*, *Food Technology*, 1960, **14**, 290.

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## Food Yeast Plant in Formosa

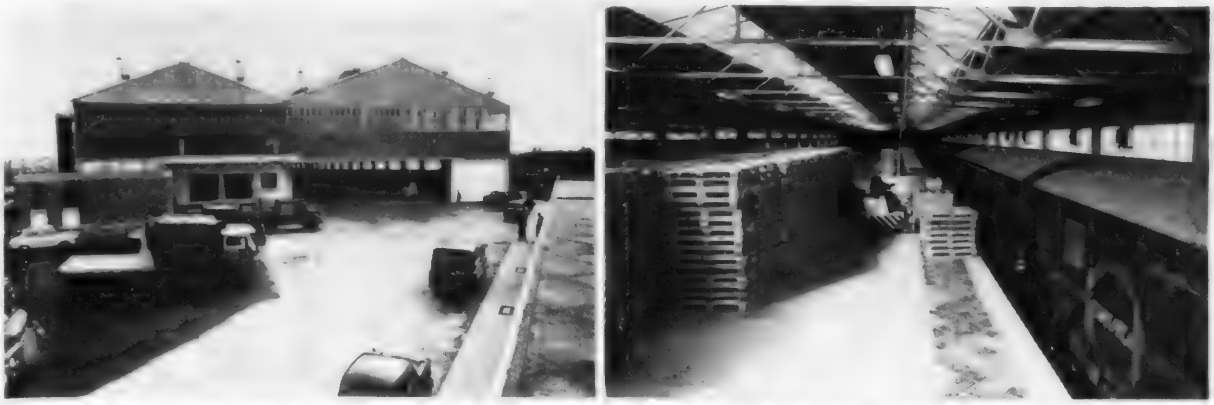
(*Concluded from page* 518)

vitamin B and animal protein in the sauce. Soy sauce is an important food in the daily diet of millions of people in South-east Asia, many families using more than one quart per week. It is not a mere condiment. Consequently, these de-fatted granules containing yeast are an important new ingredient. It saves the edible oil from the soya beans, eliminates the cause of rancidity, improves the nutritional values of the sauce and creates a new big market for yeast.

Strenuous efforts have been made to develop new uses for yeast in food products in order to use more yeast as food for direct human consumption. Substantial progress has been made especially by distributing yeast to children in schools where studies were made which proved that it is very valuable in increasing body weight and in overcoming the dietary deficiencies of children who normally eat large amounts of polished rice.

By manufacturing yeast on a mass-production scale at low cost, Taiwan is helping to fight the evils of hunger and famine on the island and in other countries where there is a deficiency of protein. When food technologists all over the world make food yeast more palatable and more acceptable for direct human consumption they, too, will help to improve the general welfare of the world's population.

# NEWS DIGEST



*British Railways Southern Region have opened a depot at Hither Green in Kent to speed the handling of fruit and vegetables from the Continent, particularly the Mediterranean area. It is on the direct London-Dover route with good road access, and comprises a goods shed 1,000 ft. long and 150 ft. wide containing a rail siding each side with unloading and loading bays so arranged that wagons and road trucks can be loaded or unloaded simultaneously. About 150 railway and 10 Customs staff will work at the depot, which initially will handle about 200,000 tons of perishables a year. The photos show:* (left): *a general view of the building with the entrance to the main delivery shed on the right; and* (right): *trays of Spanish grapes being unloaded on to pallets.*

### N. Ireland now an attested area

As a result of the satisfactory progress that has been made in the testing of cattle throughout Northern Ireland, the whole country was declared an attested area from November 25.

Northern Ireland has thus been brought into line with Great Britain, which was declared an attested area from October 1.

The scheme for the eradication of bovine tuberculosis in Northern Ireland began in May, 1949.

There are still a small number of herds which are being cleared up and will require further testing. However, the great majority of the herds are now fully attested.

Annual testing of the herds will continue probably for several years, until eventually it may be eliminated.

With the import of once-tested cattle from Eire the Northern Ireland Ministry will continue to exercise control of movement of animals and permits will still be required. Once all animals being imported are fully attested the permits will not be required, but this position may not be reached for about two years.

### Baking Industries R.A. annual general meeting

The annual general meeting and luncheon of the British Baking Industries R.A. was held at the Trocadero Restaurant in London on October 27. In moving the adoption of the Council's fourteenth annual report, Dr. R. T. Colgate said that during the last year the association had dealt with well over 2,000 technical enquiries and had made various submissions to Government bodies on subjects such as flour improvers, anti-mould agents, etc. Other suggestions should eventually save industry much money. Food additive and other long-term research work was continuing, including work on continuous mixing processes. Membership growth had been moderate and modest increases in subscriptions would be necessary. It was a sad fact, he said, that a very large number of bakers were "letting the side down" by not becoming members and yet who were profiting from the work which was done for industry as a whole.

Dr. G. A. H. Elton said that the new laboratory wing is nearly finished and a biscuit pilot plant was being installed. He detailed some of the work which is going on in the fields of raw material properties, starch, and wheat proteins.

The following members of Council were re-elected: Mr. R. P. Carr, M.B.E., M.C. (Biscuit Manufacturers); Mr. F. K. Birkett (Large Bakers and Flour Confectioners); and Mr. E. J. Scholes (Small Bakers and Flour Confectioners). Messrs. D. A. Crawford, J.P., and A. N. Elkes were elected as representatives of the Biscuit Manufacturers to fill vacancies which had arisen through resignations.

### Venesta open northern sales office

The container department of Venesta Plywood, Ltd., has opened a new northern sales office at its Manchester factory. It will be complementary to the department's existing sales offices in London and Erith, Kent, and will be equipped to answer all enquiries regarding Venesta plywood cases and barrels and fibre drums. Address is Crabtree Lane, Clayton, Manchester, 11 (tel.: EASt 1628). Manager is Mr. S. R. Watson.

### Reed enters plastic packaging field

Albert E. Reed and Co., Ltd., is extending its interests in packaging and has entered the field of plastic containers by establishing a company called Reed Plastic Packaging, Ltd.

Reed will hold 60% of the capital of the company, the remainder being held by Polythene Drums, Ltd., whose proprietors have agreed to merge their interests in packaging with those of the Reed Paper Group.

Managing director will be F. J. Clark, M.SC., M.I.E.E., M.I.MECH.E. (a director of Albert E. Reed and chief executive of the Reed Packaging Division).

Other directors will be R. F. Seddon, D.S.C., and J. H. Seddon, F.C.A. (who were the pioneers in Europe of thin wall blown polythene containers and the founders of Polythene Drums, Ltd.); L. G. Groves, M.SC., PH.D., A.M.I.CHEM.E. (general manager of the Reed Packaging Division Development Department); J. B. Purkis, D.F.C., F.C.A. (commercial executive of the Reed Packaging Division); and J. W. O'Field, A.M.I.MECH.E. (at present a director of Polythene Drums, Ltd.).

Reed Plastic Packaging, Ltd., will market a range of standard plastic containers initially in 5-45 gal. sizes and will introduce a new range of fibreboard-clad polythene containers which will be marketed by Reed Corrugated Cases, Ltd., another member of the Reed Packaging Division.

### Bush's new club premises

A new sports and social club was opened on September 21 by Mrs. Eric Bush, wife of the chairman of W. J. Bush and Co., Ltd. The club, at 25, Mare Street, London, E.8, very near the firms' works at Ash Grove, will provide Bush's employees with a modern canteen and clubroom with many amenities.

### Baker Perkins apprentices' hostel opened

Mr. Peter J. Thomas, M.P., Parliamentary Secretary to the Ministry of Labour, opened a new wing of Baker Perkins, Ltd., apprentices' hostel in Peterborough on October 12.

The new wing permits more than double the previous number of apprentices to be accommodated.

Baker Perkins, Ltd., took over the house called "High Trees," once the home of a former mayor of Peterborough in 1956, to provide a residence for student apprentices from outside the locality. Because only eleven could be taken at one time, apprentices were only permitted to stay there during their first year and thereafter were found lodgings in the town. Now student apprentices may be able to stay in residence for two years at least.

### Film on ion exchange

An instructional film dealing with ion exchange will be available from January 1 from the Permutit Co., Ltd. It is in 16 mm. sound and colour and runs for 27 minutes, and forms an introduction to the subject of ion exchange for students and potential industrial users. The company say that it is not an advertising film.

### Record milk supplies in September

Supplies of milk in September totalled 151¼ m. gallons, the highest figure ever recorded for that month and the seventh consecutive month of record output from farms in England and Wales. September output was 16·9% above the figure for September, 1959, with the East Midlands, Far Western, Mid Western, Northern and North Western Regions showing greater percentage increases than the average.

Yet another record was achieved in September when sales of milk for liquid consumption totalled 115¼ m. gallons.

Supplies for manufacturing purposes amounted to over 36 m. gallons in September. Butter and cheese manufacture absorbed 12¼ m. gallons each, equivalent to 2,400 tons of butter and 5,300 tons of cheese. The September figure of 4¾ m. gallons of milk for cream making is the best ever for this month. In fact, during the past twelve months, 60¼ m. gallons of milk were sold for cream—the highest figure ever recorded.

*Venesta Foils, Ltd., whose Silvertown and Glasgow factories already account for more than a third of the country's aluminium foil output, have made a further substantial increase in production capacity. Two new Robertson rolling mills came into operation last month at the Silvertown works and have increased this factory's output by nearly 25%. Both are designed to roll foil up to 30 in. wide.*

### Sugar Board's annual report

The main points of the Sugar Board's third annual report, for the year ending June 30, 1960, are:

1. The Surcharge remained unchanged at the rate 1¾d. a lb. (refined basis) which was fixed in January, 1959. World market prices during the year were generally depressed, and averaged 2·97 cents a lb. f.a.s. Cuba compared with 3·25 cents for the Board's previous financial year. The recent recovery in world prices did not, in fact, take place until after the end of the Board's financial year.

2. The result of the Board's transactions during the year can be summarised as follows:

(*a*) net outgoings of about £27¾ m. on the purchase (at prices negotiated by H.M.G.) and resale (at world prices) of nearly 1·7 m. tons of Commonwealth sugar costing £74 m. and of about £11¾ m. in respect of the production of just over 800,000 tons of sugar by the British Sugar Corporation, Ltd.;

(*b*) net receipts of about £39¼ m. in respect of Surcharge collected during the year; and

(*c*) a deficit of some £191,000 after charging interest and expenses. This under-recovery follows a surplus of £717,000 last year.

3. The accumulated under-recovery of £7·1 m. carried forward to the next accounting period is well within the £25 m. which the Sugar Act authorises the Board to borrow in order to avoid the necessity of making frequent changes in Surcharge to match the fluctuations in world free market prices.

### N. Ireland animal feed plant opened

Claimed to be one of the largest and most modern animal feed factories in Europe, the new Belfast plant of Associated Feed Manufacturers built at a cost of £2 m. was opened on October 19. Four companies will share in the production—British Oil and Cake Mills, Crosfields and Calthrop, Lever's Feeds, and R. Silcock and Sons.

### Canning anniversary banquet

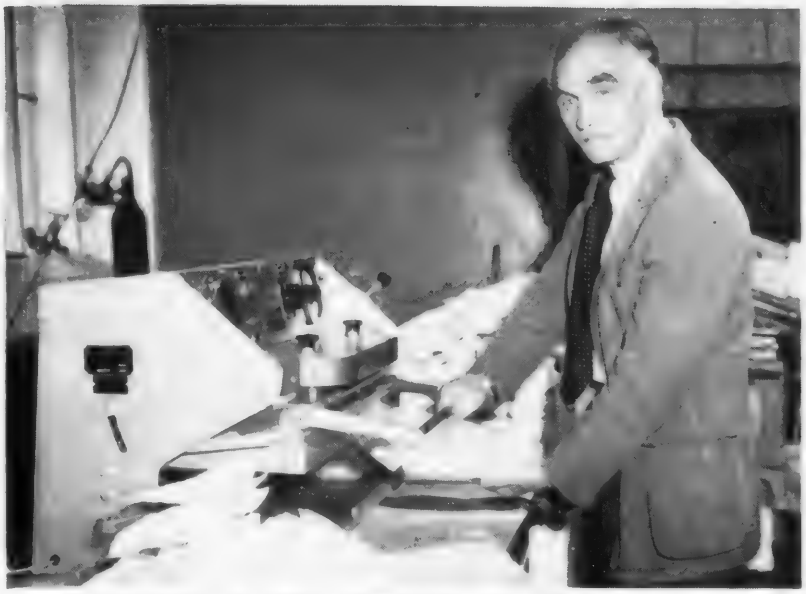
A banquet was held in London's Guildhall on October 13 in the presence of the Lord Mayor of London, Sir Edmund Stockdale, to commemorate the 150th anniversary of the introduction of canned foods.

The Lord Mayor proposed a toast to the memory of Nicholas Appert, Brian Donkin and the pioneers of the canning industry. Sir Robert Barlow, chairman of the Metal Box Company responded.

The banquet marked the culmination of the anniversary year activities which included exhibitions and displays in many parts of the country, together with a number of special press supplements, all tracing the development and history of canned foods from the earliest beginnings up to the present day.

### Record year for Heinz

Sales for the year ended April 23, 1960, showed an increase of 5·4% over the previous year and created an all-time record for the company, said the annual statement to shareholders. The trading profit of £4,457,000 was also a record, and profits after tax—£2,330,000—showed an increase of £11,000 over last year.



*Mr. Eric Shipton, the famous mountaineer and explorer, is departing from established exploring practice by taking food packed in bags of transparent nylon film instead of cans for his forthcoming expedition to the Patagonian ice cap. The film is "Ralsin" and each bag will contain four days' rations for the four-man party. Cheese, oats, milk powder and coffee are vacuum-sealed but sugar is sealed in nitrogen. Mr. Shipton is shown operating a vacuum sealing machine on one of his packs.*

### British automation for Russian factory

An order has been placed with Honeywell Controls, Ltd., covering instrumentation for the automatic control of a Russian sugar factory. The contract is from the main contractors for the factory, Vickers and Bookers, Ltd.

Value of the equipment, most of which will be made in Scotland, is £30,000. It includes standard and miniature instruments for controlling temperature, pressure, flow, *p*H and liquid level.

Honeywell recently obtained a similar order worth £300,000, covering automatic control equipment for a Russian chemical plant.

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*These new "Three Cooks" powdered soups contain ingredients which are freeze dried, and are packed in alkathene-lined bags in 7 lb. catering tins and in 1¼ lb. bags.*

### United Glass, Ltd.

Group production and sales for the half year to June 30, 1960, were appreciably greater than in the first half of year 1959, while the profit earned was in excess of the corresponding amount in any previous year. This result was obtained in the face of higher labour costs associated with the introduction of the shorter working week for our employees.

The incidence of increased costs will be even heavier in the second half of the year, but against this, it is anticipated that Group sales for the year will constitute a record. The pattern emerging fully confirms the chairman's forecast at the annual general meeting that subject to unforeseen circumstances stockholders may look forward with confidence to a further satisfactory increase in profit when the year's results are presented.

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### Morgan Crucible Co.—change of address

On April 1, 1961, the Crucible Department will become a wholly-owned subsidiary company of The Morgan Crucible Co., Ltd. It will be called Morganite Crucible, Ltd., and will operate from Norton, near Worcester.

The address of the Sales and Technical Departments is now at The Morgan Crucible Co., Ltd., Norton Works, Worcester (telephone: Worcester 26691; Telex: 33191).

The Demonstration and Test Foundry will remain at Battersea.

## *Technical Press Review*

## Instant Milk Manufacture

The current issue of **Dairy Engineering** contains an article by Dr. C. W. Hall and Dr. T. I. Hedrick, of Michigan State University, on the manufacture of instant milk. Other contributions include: "Psychrophilic Bacteria in Pasteurised Milk," "Practical Cleaning Routines for the Dairy," part II, a review of the Dairy Show and a preview of the Corrosion and Metal Finishing Exhibition.

"Heat Exchangers" are the subject of a special feature in **Manufacturing Chemist** this month; other articles include "Carbohydrates in the Chemical Industry — 1," "Works Manager's Guide to the Factory Act" and Progress Reports on detergents, antibiotics, hormones and fertilisers.

**Automation Progress** this month includes articles on "Synchros—How they work and who makes them," "Driverless Trucks Speed the Goods" "Self-organising Systems (review)," and "Circuit Blocks and Initial Design."

A preview of the Smithfield Show is featured in **World Crops** this month. Among other articles are: "The Importance of Shade—1. Shade for Tea, 2. Shade for Coffee"; "Feeding the World's Millions—2."

**Fibres and Plastics** includes articles on "Polythene-coated papers—present and future uses," "Processing high-density Polythene," and a synopsis of a symposium on "High temperature resistance and thermal degradation of Polymers."

The current issue of **Petroleum** contains a report on Britain's new refinery at Milford Haven; among other contributions are articles on "Sizing of Vapour Relieving Systems" and "Combustion Research."

"Fluid Control" is specially featured in **Chemical and Process Engineering**, and this month's issue contains articles on "Principles of Fluid Control" and "Flow Measurement Errors." Among other contributions are "Transient Performance of Heat Exchangers" and a report on the Congress of Industrial Chemistry in Barcelona.

**Paint Manufacture** this month includes a guide to synthetic resins introduced in the last twelve months, "Recent Advances in the Use of Epoxide Resins in Surface Coatings" and "Some Commercial Aspects of Water-thinned Paints."

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## Forthcoming Meeting

**The Nutrition Society,** Middlesex Hospital Medical School, London, W.1, Saturday, December 17: symposium on "Calorie Balance in Man" (chairman, Sir Charles Dodds, F.R.S.).

## *News from Scotland*

### New Openings

Lincolnshire Canners, Ltd., are understood to be planning a new factory at Arbroath near the new Metal Box factory which is nearing completion. B.O.T. approval has been indicated. This area has been favoured increasingly in the past ten years by canners and food processors seeking suitable location to handle fruit and vegetable processing.

**Poultry plant**

Burnett and Co., poultry processors of Rothienorman, have made application for ground at Inverurie where they plan to locate a new poultry packing, processing and quick freezing plant handling a much increased volume of production than is presently possible at Rothienorman.

**Canadian trade possibilities**

Canadian food trade interests visited Glasgow in October to investigate the possibility of increased Canadian food trade with Scotland. The plan covers canned and frozen fruits and vegetables, meats, fresh foods and fruits and a variety of packaged food lines. Canadian interest in this market will be centralised through Glasgow where the nucleus of a food trade with the Dominion will allow expansion.

**New board mill**

Thames Board Mills, Ltd., of Purfleet, Essex, are to build a new board mill at Cumbernauld, new town to the north of Glasgow. This new plant will be erected as speedily as possible and will be used to serve the Scottish food industries with packaging materials supplementing the service from the main factories at Purfleet and Warrington.

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**Ross Group buy Australian firm**

Ross Group, Ltd., have completed the purchase of the West Australian firm of International Fisheries. This is the first step by British interests for large scale development of Australia's vast fishing resources. This move was foreshadowed by Mr. Jack Vincent, joint managing director of Ross Group on his visit and tour of Australia last year.

International Fisheries is the largest private fishing and processing organisation in Western Australia and is particularly prominent in the crayfishing business. Last year the firm exported almost £250,000 worth of crayfish tails to the U.S.A., and in addition it is a major importer and distributor of fish from Britain and Scandinavia. The company operates processing and freezing plants in West Perth and also Jurien Bay, one of the major crayfishing grounds.

The company owns a number of fishing vessels and operates its own $DC_3$ aircraft to fly catches from Jurien Bay and has built private airstrips at Jurien Bay and Snag Island.

Ross Group Australian Director, Mr. Len Johnson, stated that the company would be known as Ross International Fisheries Pty., Ltd. and would embark immediately on extensive expansion schemes extending and modernising plant and equipment, some of which would be made in Australia and some from Britain.

New processing plants would be completed in Dongara and the company would step up the export of crayfish by at least 100% over last year.

**Mr. J. Carl Ross (*left*), chairman and joint managing director, and Mr. Jack Vincent, joint managing director, of Ross Group, Ltd.**

### Erections and Extensions

**Foot's, Ltd.**, boxmakers, are extending their factory premises in North Shields, Northumberland.

*

**Warrington Co-operative Society, Ltd.**, have plans in hand to rebuild their bakery in Winnick Road, Warrington, Lancs., at a cost of £70,000.

*

**Graves (Bakers), Ltd.**, are having bakery and office premises erected in Picktree Lane, Chester-le-Street, Co. Durham.

*

**Ayres and Grimshaw, Ltd.**, are having a packaging machinery factory built on a three-acre site at Braunton Road, Barnstaple, Devon.

*

**J. Mackay and Co., Ltd.**, mineral water manufacturers, Corporation Street, Newcastle-on-Tyne, are converting the former Coatsworth Cinema premises at Gateshead-on-Tyne, Co. Durham, into a soft drinks factory and distribution depot.

*

**The Kellogg Co. of Great Britain, Ltd.**, cereals manfacturers, are having a three-floor warehouse extension built at their factory at Stretford, Manchester, at a cost of £58,000.

*

**Valente and Co., Ltd.**, are having an ice cream factory built on a site at 4, The Staithes, Scarborough, Yorks.

*

**Morrison Confectionery Co., Ltd.**, have acquired 710 sq. yds. of land for the early erection of a factory at York Street, St. Philip's, Bristol.

*

**Marshall Taplow, Ltd.**, are having new distillery and office premises erected at Leytonstone Road, Stratford, London, E.15.

**Moors' and Robson's Breweries, Ltd.**, are having a factory built on a site in Queen Margaret's Road, Scarborough, Yorks.

*

**Associated Maltsters, Ltd.**, are extending their kiln and silos in St. John's Road, Wallingford, Berkshire, by roughly one-third to give a total of 100,000 sq. ft. of premises.

*

**The Richmond Sausage Co., Ltd.**, are extending their bakery at Gilesgate Moor, Durham.

*

**T. Wall and Sons (Ice Cream), Ltd.**, are having a new depot erected at Wear Street, Sunderland, Co. Durham.

*

**Biebegs Extracts of Meat Co., Ltd.**, are having a factory built at Sligo Quay, Sligo, Eire.

*

**Wilson's Edinburgh Bakeries, Ltd.**, are extending their bakery on the Foxhunter's Estate, Whitley Bay, Northumberland.

*

**J. Nimmo and Son, Ltd.**, have plans in hand to extend their mineral water factory at Castle Eden, Easington, Co. Durham.

*

**R. A. Peacock and Son, Ltd.**, are having a food factory erected at Thornliebank, Renfrewshire, Scotland.

*

**Thomas and Evans, Ltd.**, mineral water manufacturers, are having a bottling factory built at Cardiff, South Wales, at a cost of £200,000.

*

**J. P. Simpson and Co., Ltd.**, maltsters, of Greenbatt, Alnwick, are having factory premises erected on the Tweedside Industrial Estate, Berwick-upon-Tweed, Northumberland.

# PEOPLE

CAPTAIN E. J. BEAUMONT, group personnel officer of Ross Group, Ltd., since 1956, has been appointed group personnel director and also a director of Ross Group (Fish Merchants), Ltd. Captain Beaumont, who came to Grimsby in 1954 as secretary of the Grimsby Trawler Officers' Guild, is deputy chairman of the Human Relations Group of the Grimsby and District Local Productivity Committee. Formerly a master mariner and R.N.R. officer, he went to sea in 1942 and was attached to the British Pacific Fleet until the end of the war. He is married with two daughters.

■

MR. DENIS B. MUIRHEAD has arrived in London from Australia to take over the position of London representative of the Australian Meat Board from MR. P. BECKER later in the year.

■

MR. D. A. OGILVIE, M.A., A.M.I. MECH.E., a drawing office manager with Baker Perkins, Ltd., has been appointed a director of Baker Perkins (Exports), Ltd. Mr. Ogilvie, who joined the company in 1955 as personal assistant to the then chairman of the board of management, became a drawing office manager in 1958. He is a specialist in biscuit machinery, and will concentrate on this field in the export markets.

■

The newly-elected chairman and managing director of Scribbans-Kemp, Ltd., MR. F. N. MARTIN, speaking at the company's annual general meeting on October 17, announced the retirement of the firm's previous chairman, MR. H. OLIVER-KING, who will, however, remain on the board and be available for consultation.

MAJOR-GENERAL G. P. B. ROBERTS has been appointed vice-chairman.

■

MR. IVOR PRICE, chairman of United Dairies, Ltd., has been appointed chairman of Unigate, Ltd., for the coming year.

MR. ERNEST TAYLOR, who has been chairman of the company since the death of Mr. Leonard Maggs, has now reverted to the position of deputy chairman.

■

MR. J. E. B. GREEVES has been appointed assistant managing director to the board of Bramigk and Co., Ltd. Previously engineering and production director, and, later, chairman and managing director of Fry-Cadbury, Ltd., Montreal, Mr. Greeves returned recently to this country.

■

MR. ALAN S. GILL has retired from the Board of George Cohen, Sons and Co., Ltd., and will practise as an Industrial Consultant.

**Capt. E. J. Beaumont**

**Mr. G. Darby**

Crosse and Blackwell, Ltd., have appointed MR. GEOFFREY DARBY, M.A., as grocery marketing manager, covering both Crosse and Blackwell and Lazenby products. Born in London in 1927, Mr. Darby began his business career with Thomas Hedley and Co., Ltd., and after marketing experience with Alfred Bird and Sons and Beecham Foods, Ltd., became marketing director of McCann-Erickson Advertising, Ltd., until his present appointment.

■

MR. LEONARD COOKE, O.B.E., J.P., who has since 1949 been chairman of the Finance Committee which controls the C.W.S. Bank, has been elected president of the Co-operative Wholesale Society.

■

Four representatives of W. and R. Jacob and Co. (Liverpool), Ltd., have now retired after service with the company averaging 34 years. They are MR. KEITH A. MURRAY, MR. REGINALD A. WHITEHEAD, MR. HARRY J. W. UNDERHILL and MR. JAMES WATSON.

Both Mr. Murray and Mr. Watson joined the company in 1923, Mr. Murray being attached to the London depot and Mr. Watson to the Glasgow depot. Mr. Underhill, who joined the company in 1926, was attached to the Birmingham depot, and Mr. Whitehead has been with the company since 1932 and has travelled in the London area the whole of that time.

■

MR. A. G. MILL, a Livestock Husbandry Advisory Officer of the National Agricultural Advisory Service, has been appointed Agricultural and Food Attaché on the staff of the British Embassy in Buenos Aires. He is due to arrive in Argentina on October 8.

Mr. Mill will replace MR. R. H. SMYTH, O.B.E., who left Argentina at the end of April and retired from the public service at the end of July.

■

MR. ALEXANDER MCMILLAN has now taken up duty as manager of the Scottish Co-operative Wholesale Society, Ltd., milk department and creameries. He succeeds MR. MCBRIDE, who ended his period of office in hospital, recovering from an operation.

MR. J. S. BROUGH, M.I.CHEM.E., M.I.MECH.E., M.INST.F., F.INST.PET., has been appointed as assistant managing director of Mono Pumps, Ltd. His entry into the engineering and chemical fields commenced at the Manchester College of Technology, and during his long association with these industries, he filled appointments as chief engineer and general manager of production at Monsanto Chemicals, Ltd., and technical director of Humphreys and Glasgow, Ltd.

■

MR. W. J. ADAMS, general manager and secretary of the Australian Canned Fruits Board, retired at the end of September. Mr. Adams, who is 66, will continue to serve the Board in an advisory capacity.

■

Two Robertson representatives have recently retired after almost 40 years of service. MR. J. F. FINCHAM joined James Robertson and Sons (PM), Ltd., in April, 1921. Although he started as area representative for East Kent, Mr. Fincham soon moved to represent Suffolk, where he has been ever since.

MR. W. L. HAZLEMAN joined the House of Robertson in July, 1921, at the age of 26.

■

MISS AGNES L. RICHMOND, M.B.E., J.P., has been compelled by ill-health to resign from the Committee on Consumer Protection. In her stead, the President of the Board of Trade has appointed Councillor MRS. I. Q. STEWART, J.P., who has been a member of the Edinburgh City Council since 1954, and is the wife of a member of the Edinburgh Trades and Labour Council.

■

Saward Baker have appointed two more marketing executives, MR. I. M. GILLIES (32) who was assistant general manager of T. W. Beach and Sons, Ltd., and MR. J. A. KENDRICK (29), who was assistant to the sales director of Meredith and Drew, Ltd.

■

Following the recent appointment of MR. A. W. PICKLES, F.C.A., to be accountant controller at Group headquarters, he has now relinquished the office of joint secretary of Beecham Group, Ltd. MR. G. HAMILTON, M.A., who has hitherto held the office of a joint secretary, will continue as secretary of the company.

■

COW AND GATE, Ltd., announce that MR. VALDER B. W. A. GATES and MR. ALFRED E. S. W. TAYLOR have joined the board of the company and those of its subsidiaries, Home Counties Dairies (Holdings), Ltd., and Home Counties Dairies, Ltd.

MR. T. J. SHEEHAN has been appointed to the board of Home Counties Dairies, Ltd.

# OVERSEAS NEWS

## F.A.O. urges improved fish handling

An international attempt to improve the tagging and canning of Mediterranean tuna has been mapped out for action by the General Fisheries Council for the Mediterranean (GFCM) during the next two years.

After ending its sixth session held in Rome at F.A.O. headquarters, the Council adopted recommendations and resolutions put forward by its five working committees. Among them were resolutions calling for joint action in the field of tagging tuna, an oceanographic survey of the eastern part of the Mediterranean Sea, and a study by F.A.O. of preserving problems.

Dr. Michel Girard, Council secretary, said that the wealth of tuna known to inhabit the area is likely to provide a great deal more food fish for the consumer and more income for the producer if there is a concerted effort.

The programme would involve financial support from the GFCM member countries, and participation of the members in providing data necessary to proceed with experiments and research; one country would be chosen as the site of the preservation studies.

The tuna programme was part of the 1961/62 work schedule adopted by the Council.

Also included were several projects to be undertaken with F.A.O. assistance and with special financial support from GFCM member countries.

The Council also asked for the assistance of F.A.O.'s Fisheries Division in testing and introducing new techniques for finding and catching fish and in standardising fish packing. These programmes would require assistance by experts from the member countries plus special financial support.

### Corn Products to build S. America's largest corn wet-mill

A new plant is to be built at a cost of approximately $10 million by Refinacoes de Milho, Brazil, Corn Products Co.'s Brazilian affiliate in Sao Paulo. It will comprise the largest corn wet-milling facility in South America and will be located at Mogi-Guacu, 100 miles northwest of Sao Paulo.

Located within the potentially rich interior area of Brazil, this new addition to the local industrial economy complements the national five-year over-all development plan inaugurated recently by the State government. Construction of the new plant, which will involve a two-year building programme, is expected to commence early in 1961.

The new Brazilian plant will incorporate the most modern facilities for corn wet-milling processes in the world, and has adequate provision for expansion to accommodate future demands included in construction plans. When it begins production, it will employ 500 people.

### Kenya produces condensed milk

A new challenge to imported goods was launched at the Royal Show in Nairobi in September with the introduction by Kenya Co-operative Creameries, Ltd., of their new product—tinned, sweetened, condensed, skimmed milk.

In the past, large quantities of condensed milk had to be imported from abroad, mainly Holland and Denmark. Last year Kenya spent over £116,000 on imported tinned milk.

The new product results from many months of research and experimental work by Kenya Co-operative Creameries. The latest machinery for the production of condensed milk has been introduced from the U.K.

### Second Danish food fair

The second Danish Food Fair will take place in Aalborg from June 2-11. More than 500 different items of Danish foods will be on display from the 200 exhibitors.

A special section will be devoted to food producing and packaging machinery.

### Britons are among world's best fed

The U.K. today ranks amongst the best-fed countries in the world, according to an F.A.O. statistical survey, which states that the U.K. holds third place for calorie content of national average food supplies in fifteen selected European countries, and fourth place on the F.A.O.'s world list.

The calorie content of food supplies for inhabitants of the U.K., per head and per day, is set at 3,260 calories by the experts of F.A.O. This figure is bettered only by Ireland, with a daily average of 3,500 calories, by Denmark, with 3,350 calories, and New Zealand, with 3,430 calories. Close runners-up to the U.K. record for the period 1958/59 covered by the new survey, are Canada, with 3,100 calories and the United States with 3,100 per day.

### Aluminium containers cut bacon costs

The Danish Bacon Co. says it has considerably reduced shipping costs by the use of a re-usable collapsible aluminium container for the transport of bacon sides. About 250 of these containers, which unfold to measure 6 × 4 × 3 ft. and weigh about 250 lb., will be used this year.

### U.S. flour mill for Ghana

An agreement has been signed between the Ghanaian Government and the Pillsbury Company of U.S.A. for the construction of a flour mill in Ghana, to be built and operated by a new Ghana Company in which the Government and the U.S. concern would have financial interests, and located at Tema Harbour.

It will have a capacity of 4,000 bags of 100 lb. a day, with adequate storage facilities. Erection of the mill would begin immediately arrangements were completed for the site at Tema and it was expected to start operating within two years.

### Foam rubber protects bananas

From Jamaica, Barclays Bank D.C.O. reports local sources as stating that the experiment in which rubber foam mattresses were used on the banana handling tables instead of the usual banana "trash" has been very successful in reducing scarring and bruising of the fruit. This new method of handling is to be adopted generally as part of the drive to deliver fruit to the U.K. in prime condition.

### Welcome news for S.A. children

Ten cents will be the equivalent of one shilling when South Africa introduces decimal coinage next year, and it is intended to make the one cent sweet lines bigger than the current penny lines. This is welcome news to children who foresaw a 20% price increase for suckers, liquorice straps and other favourites next year. Sweet manufacturers met recently to discuss a co-ordinated date for the introduction of decimal price lists. The secretary of the association said that a date had been suggested, but it had still to be ratified by all manufacturers in the Union. "In some cases it is practically impossible to alter the present size of sweets, especially the moulded types, and the decision to increase weight was left to individual manufacturers. Some of the moulds lend themselves to alteration, however."

### German food fair

An International Gastronomy Fair will take place in Munich, West Germany, from April 1-May 1, 1961.

### New Spanish soya factory

A new factory is under construction in Tarragona, Spain, for the manufacture of soya flour at a cost of 90 million pesetas. It will have a capacity of 80,000 tons of cattle fodder, enough to cover the national demand, and 20,000 tons of edible oil.

### Widespread food poisoning traced to one worker

South Australia's Public Health Department has traced an outbreak of food poisoning to a wart on a factory employee's hand.

Director-General of Public Health, Dr. Woodruff, said that a type of staphylococcal infection found in a brand of pork and veal brawn had also been found on the hand of one of the manufacturer's employees, who was now under treatment.

The infected meat caused a widespread outbreak of food poisoning in Adelaide and several country towns.

### Honduras food regulations

According to Decree 307 of Honduras, wheat flour produced in that country must be enriched in accordance with stipulations issued by the public health authority. Imports of machinery, equipment and spare parts for the establishment of enriching plants will be exempted from Customs duties and other taxes.

### Barbados potato crisp factory

A plant in Bridgetown for the manufacture of potato crisps is reported from the Barbados by Barclays Bank D.C.O. to be ready to go into operation. The output of the plant is expected to exceed 750,000 8-cent packets annually. It is expected that in addition to potato crisps this new concern will make breadfruit, plantain, banana and yam crisps.

### M.I.T. to enlarge food technology department

The Massachusetts Institute of Technology is to enlarge the existing Food Technology Department, which will be renamed the Department of Nutrition, Food Science and Technology. Dr. Nevin Stewart Scrimshaw, director of the Institute of Nutrition of Central America and Panama (INCAP) and regional adviser on nutrition of the Pan American Health Organisation, has been appointed head of the department. He will assume his duties at M.I.T. on August 1, 1961, and will remain a technical director of INCAP.

**"I wonder whether you could oblige me with a light?"**

### Ghana fruit processing factory nearly ready

The Ghana Agricultural Development Corporation's new fruit processing factory at Nsawam will commence operating next month, according to Barclays Bank D.C.O. in Accra. The factory, which cost £G70,000, is expected to produce three million tins of tomato purée in the first year of production.

### Fifth Queensland sugar terminal opened

Queensland Premier, the Hon. G. F. R. Nicklin, M.L.A., has officially opened the new bulk sugar terminal at Mourilyan, North Queensland. It is the fifth to be built at Queensland ports in the last three years and has cost £1,800,000. It has a storage capacity of 150,000 tons and will be used for the shipment of the output from the Mourilyan, Babinda, Goondi, South Johnstone and Tully mills.

### Israel's egg exports doubled in one year

Israel exported 22·9 m. dozen shelled eggs last year compared to 9·4 m. dozen in 1958—more than doubling the trade in one year.

This achievement reflects the astonishing growth of the Israeli poultry industry. During the past twelve years egg production has risen by more than 400%—from 237·5 m. eggs worth £6,583,000 (Israeli) to 960 m. worth £75,000,000. Poultry meat production has increased from 5,000 tons in 1948, worth £3,000,000 (Israeli) to 33,000 tons in 1959, worth £56,000,000.

## OBITER DICTA

● More transactions at service stations in the U.S. involve Coca-Cola than motor oil.—*Financial Times.*

● Personally he sold "more for the dog than I do for the old man and knowing some of the old men I don't blame the ladies."—*Bakers' Review.*

● The inventor of meat preservation by canning was the Russian scientist Vasilii Nazar'evich Karazin.—*Myasnaya Ind. S.S.S.R. 29, quoted by Food Technology.*

● Nowadays if a fly appears in a restaurant there are complaints to the manager and people throw plates and all that sort of thing.—*Dr. N. Goodman, quoted in The Times.*

● Told recently that one could throw an egg over a house and that, provided it landed on grass, it would not break, I determined to put this to the test.—*Letter in the New Scientist.*

● Whether some gastronomes, whose world is limited by the rim of the plate, like it or not, the Briton is a more civilised diner-out than his French opposite number and doesn't mind eating some atmosphere.—*Daily Telegraph.*

● We are so quality conscious that our food technologist recently came up with a formula for a Shopsy Frank(furter) guaranteeing that if you are going to have heartburn, you have it immediately instead of three o'clock in the morning.—*Concessionaire Merchandiser.*

● India may broadcast music to growing crops . . . Experiments have revealed that a rice paddy field "excited" by music produces from 22 to 58% more rice . . . The technique involves broadcasting soft music to standing crops from strategically located loudspeakers.—*The Guardian.*

● The Beachcomber, the May Fair Hotel's new Polynesian restaurant, offers what it calls a beverage menu with a startling list: Tonga Ruby, "tropical paralyser . . . not for cissies"; Waikiki Broad, "a hellish combination of Curacao brandy." I drank a cowardly, straight brandy.—*Daily Express.*

● The barbecue restores (momentarily at least) man's lost sense of dominance. The fire is his. He is in control over the food. And what he's cooking doesn't brand him a cissy since it is usually a cut of beef or a cob of corn and nothing like a cake or a pear-and-cream-cheese salad.—*Daily Telegraph.*

# Recent Patents

COMPLETE SPECIFICATIONS ACCEPTED

841,355. A. Diefenbach: Treatment of olives and other oleaginous materials to extract oil therefrom.
842,00[illegible] R. G. T. Baader: Methods of and machines for dressing fish.
841,620. Rohm and Haas Co.: Process for the purification of sugar juices.
841,960. Baker Perkins, Ltd.: Apparatus for re-positioning articles lying on a moving conveying surface.
841,720. Virginia-Carolina Chemical Corporation: Means for protection of foodstuffs and other materials from depredation by rodents.
841,973. Standard Brands, Inc.: Irish moss food product.
841,756. Licencia Talalmanyokat Ertekesito Vallalat: Method for the continuous purification of milk of lime for use in sugar mills.
853,305. E. S. and A. Robinson, Ltd.: Transparent bags.
853,144. Minikay, Ltd.: Thermal insulation of cold pipelines or of other cold hollow bodies.
853,246. Paton, Calvert and Co., Ltd.: Closures for containers.
852,999. J. Samuel White and Co., Ltd.: Ice cream machines.
853,154. H. Simon, Ltd.: Roller mills for grinding cereal products.
853,255. T. R. Anderson: Treatment of meat.
853,259. Stabil Internacional S.A.: Device for sealing bottles with crown caps under vacuum.
853,046. E. A. Weaver: Preservation of vegetable products.
852,946. Dumont Freres and Cie.: Wrapping for the preservation of fresh yeast.
853,924. E. S. and A. Robinson, Ltd.: Bags provided with tear-strips.
853,925. E. S. and A. Robinson, Ltd.: Bags or wrappers provided with tear-strips.
853,928. Corn Products Refining Co.: Preparation of dustless starch.
853,665. Carle and Montanari S.p.a.: Apparatus for moulding chocolate.
853,834. Unilever, Ltd.: Beverages.
853,687. F. J. Ballard and Co., Ltd., and R. J. Broomer: Industrial ovens.
853,692. Soc. d'Etude de la Propulsion par Reaction: Regulating device for controlling the flow of two fluids.
853,773. Corn Products Co.: Starch manufacturing process.
853,879. W. G. Thomas: Milk delivery reception cabinet.
853,828. Staley Manufacturing Co.: Methods for treating starch.
853,810. Van Camp Sea Food Co.: Stabilised oil-soluble vitamins.
855,229. J. Varney and Co., Ltd.: Method of and apparatus for controlling the temperature of a liquid in a tank or other container.
855,349. Unilever, Ltd.: Confectioners hard butter.
855,350. Unilever, Ltd.: Flavouring substances and their preparation.
855,422. British Wedge Wire Co., Ltd.: Grading conveyers.
855,174. Arenco, Ltd.: Packaging machinery.
855,445. Hansel - Junior G.m.b.H.: Method of wrapping articles, for example, chocolate in the form of bars.
855,206. Daveat Milk Processes Co.: Process for sterilising milk.
855,310. Howards of Ilford, Ltd.: Chocolate preparations.
855,401. Brewing Patents, Ltd.; R. D. Hall and G. A. Howard: Bittering of beer.
855,290. Mather and Platt, Ltd.: Machines for filling containers with fluid.
855,415. Food Machinery and Chemical Corporation: High-speed weigh-type filling system.

# New Companies

**Cambridgeshire Poultry Packers, Ltd.** (669277.) £3,000. Subs.: Dorothy M. Graeme and Gordon V. Graeme.

**Rumble McColl, Ltd.** (669415.) Hales Street, London, S.E.8. To carry on the bus. of mnfrs. of and dlrs. in food preservatives of all kinds, chemicals, etc. £100. Dirs.: David H. Rumble and June E. Rumble.

**S.M.H. (Quality Foods) Ltd.** (669470.) 2, Cheapside, Melton Mowbray. £1,500. Dir.: Mrs. S. M. Hallam, 15, Devonshire Avenue, Beeston, Notts.

**Micro-organics Co., Ltd.** (669555.) 64, North Walls, Winchester, Hants. To carry on bus. of mnfrs. of and dlrs. in foodstuffs and fertilisers, including those specially compounded for argicultural and horticultural purposes.

**Charlie-Boy Pickles, Ltd.** (669775.) 2, Ropery Street, Bow, London, E.3. £100. Dirs.: Edward C. Snooks and John Snooks.

**Bernard Matthews (Weston), Ltd.** (669922.) Great Witchingham Hall, Norwich. To carry on bus. of fowl breeding, etc. £100. Subs.: Bernard T. Matthews and Mrs. Joyce K. Matthews.

**S. J. Church and Sons (Meat Products), Ltd.** (669952.) 453, Salisbury House, London Wall, E.C.2. To take over bus. of mnfrs. and retailers of meat products cd. on at Aberdeen House, High Street, Epping, by S. J. Church and Sons, Ltd. £5,000. Dirs.: Grace E. Church and Derek J. Church.

**Austin Packaging, Ltd.** (670324.) To carry on bus. of mnfrs. of and dlrs. in boxes, etc. £100. Subs.: G. Ll. Law and Trevor Copley.

**La Maison Provencale, Ltd.** (670367.) 2, Drapers Gardens, London, E.C.2. To carry on bus. of mnfrs. of and dlrs. in mineral and aerated waters, cordials, wines, spirits, beers, cider, perry, etc. £100. Dirs.: Robert E. Bouscarle, Gerard J. Bouscarle.

**James Soft Ices, Ltd.** (670456.) 159, Charwood Road, Shepshed. To carry on bus. of mnfrs. of and dlrs. in ice cream, etc. £1,000. Dirs.: Wm. A. James and Eric A. Gibson.

*These particulars of new companies recently registered have been extracted from the daily register of Jordan and Sons, Ltd., Company Registration Agents, 116, Chancery Lane, London, W.C.2.*

# Trade Marks

**SKIPPY.**—802,236. Peanut butter. **Corn Products Co.,** 717, Fifth Avenue, New York, U.S.A.

**RED CLOVER.**—789,204. All goods included in Class 29, but not including cheese or powdered dairy cream or any goods of the same description as cheese or powdered dairy cream. **Buttercup Dairy Co., Ltd.,** 382, Easter Road, Leith, Edinburgh, 6.

**CORNOLA.**—790,618. Maize (corn) oil. **Edward Lev,** 58-60, Lawley Street, Birmingham, 4.

**TRADER VIC'S.**—B793, 811. All goods included in Class 29, but not including peas (cooked or dried) or any goods of the same description as peas (cooked or dried). **Victor Jules Bergeron,** 20, Cosmo Place, San Francisco, California, U.S.A.

**SEVEN SEAS.**—797,823. All goods included in Class 29, but not including preserved, dried or canned fruits, canned vegetables, canned meats or condensed milk, or any goods of the same description as any of these excluded goods. **Marfleet Refining Co., Ltd.,** St. Andrew's Dock, Hull, East Yorkshire.

**ELSEOL.**—797,824. Edible oils and edible fats and cooking oils. **Liverpool Central Oil Co., Ltd.,** 29-37, Oriel Street, Vauxhall Road, Liverpool, 3.

**PALATE JOYOUS.**—B800,873. Canned fish. **Wilts Quality Products (London), Ltd.,** Adelaide House, King William Street, London, E.C.4.

**RED DUCHESS.**—798,603. Canned fish and frozen fish. **Emard Packing Co., Inc.,** Sales Division, 107, Cherry Street, Seattle, Washington, U.S.A.

**POTATO PETE.**—801,394. Cooked potatoes. **The Potato Marketing Board,** 50, Hans Crescent, London, S.W.1. To be associated with No. 795,699 (4271,823).

**SWEET SOUTH.**—804,619. Butter. **Adams Butter, Ltd.,** Buxton Road, Leek, Staffordshire.

**CASTLE FARM.**—B793,961. Meat, fish and poultry, all being canned or frozen. **Robert Wilson and Sons (1849), Ltd.,** Skelmorlie, Ayrshire, Scotland.

**SCOTTISH PRIDE.**—786,981. Canned fruit, canned fruit salad, canned fish and canned tomatoes. **Richard D. Dudley and Co., Ltd.,** 41, Eastcheap, London, E.C.3.

**LORETA.**—802,924. Meat; fish, poultry and game (none being live); preserved and dried vegetables and fruits; jellies (for food), jams; eggs, milk and dairy products (for food); edible oils and edible fats; fruit preserves and vegetable preserves; and pickles. **Ricardo de la Serna,** 2 de Mayo 22 and 24, Seville, Spain.

**SOUTHERN GOLD.**—804,033. Butter. **Adams Butter, Ltd.,** Buxton Road, Leek, Staffordshire.

**YUHOR.**—806,327. Canned meat; bacon. **Centroproduct, Ltd.,** Heddon House, 149-151, Regent Street, London, W.1.

**ROSABELLA.**—791,425. Fish (other than live fish) and canned tomatoes. **George Harker and Co., Ltd.,** 70-72, Weston Street, London, S.E.1.

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# *FOOD Manufacture*

# INDEX VOLUME XXXV JANUARY-DECEMBER 1960

## SUBJECT INDEX

Editorial Comments are indicated by (ed.) Patent Abstract is indicated by (pat.)
Abstracts are indicated by (abst.) Correspondence is indicated by (corr.)
References to machinery and equipment are grouped under the heading *Machinery and Equipment*, and references to packs and packaging materials under the heading *Packaging*.
References to overseas items will be found under the appropriate country.


### A

Aberdeen experimental factory (*see* Experimental factory)
Accelerated freeze drying (*see* Freeze drying)
Accidents:
  during cleaning down, 332
  in industry (ed.), 274
Acetate materials for protective clothing, 114
Adaptation, dietary, 242
Additives:
  *editorial comment*, 410
  review of, 70
  sausage, 74
  testing station for (ed.), 133
Adulteration:
  of blackcurrant juice, detection (abst.), 444
  of food in Italy (ed.), 48
Adulteration of Foods Act, 1860, 479
  (*correspondence*), 519
Advertisement, largest in world (ed.), 227
Advertising, power of (ed.), 498
Aerobes, role in spoilage, 388
Aerosol microbiology (abst.), 78
Aerosols:
  *correspondence*, 419
  *editorial comment*, 272
  sterilisation by (*abst.*), 32
African consumer, factors influencing (ed.), 408
Agencies (ed.), 409
Ageing process for beef, 311
"Agribusiness," (ed.), 134
Agriculture, total land available for, 62
Aluminium:
  corrosion of (abst.), 312
  treatments for, 471
American Meat Institute Foundation, 91
Amino acid:
  composition of protein, 281
  determination (abst.), 32
  determination, spoilage measurement by, 387
  requirements, 204
  supplementation of proteins, 280
  vitamins, and relation to, 242
Ammonia determination, measuring spoilage by, 387
Anaerobes, rôle in spoilage, 388
Analysis:
  amino acid determination (abst.), 32
  antioxidant determination (abst.), 32
  diacetyl determination (abst.), 123
Animal feeds:
  antioxidants for, 446
  manufacture by Bibby, 365
Animal genetic studies, 65
Animals:
  domestic, food for, 411
  Unilever studies on, 384
Anthocyanogens in beer, 105
Antibiotics:
  as preservatives, proposal for, 38
  detection of (abst.), 174
  effect on bacteria (abst.), 261
  preslaughter effects (abst.), 78
  use in brewing, 106
Antioxidants, 75, 446
  detection of (abst.), 123
  determination of (abst.), 32
  regulations to be reviewed, 351
  synergistic effects (abst.), 32
Apples, contaminated by sprays (ed.), 48
Aprons, protective, 117
A.P.V. Co.'s golden jubilee, 265
Argentina, meat exports, 199


**GUIDE TO PAGE NUMBERS**

| | |
|---|---|
| January | 1–44 |
| February | 45–88 |
| March | 89–132 |
| April | 133–176 |
| May | 177–224 |
| June | 225–270 |
| July | 271–314 |
| August | 315–360 |
| September | 361–406 |
| October | 407–452 |
| November | 453–496 |
| December | 497–542 |


*Armstrong, Louis Satchmo* (ed.), 500
Arsenic limits in food, 12
Ascorbic acid, 72
Atherosclerosis and fats (ed.), 45
Australia:
  butter studies in, 98
  Canned Fruit Board (ed.), 2
  canned fruit prospects (ed.), 2
  indigenous foods in, 152
  meat exports, 200
  Ross Group developments in, 530
  stored grain loss in (ed.), 362
  whaling industry of, prospects, 130
Automation:
  aids to (review), 243
  at Carr's factory, 338
  at Macdonalds' factory, 5
  effect on the operator (ed.), 363
  hazards of (ed.), 499
  in Canadian sugar refinery, 161
Ayrshire cattle, 384

### B

Bacon:
  effect of prepackaging on (ed.), 271
  industry board (corr.), 79, 213
  industry, boost for (ed.), 271
  protectant, 159
Bacteria:
  control of, 156
  in chill room air (abst.), 174
  sulphite-reducing clostridia (abst.), 174
  temperature tolerance of (abst.), 526
Bactericidal hand cream (ed.), 180
Bacteriology (*see* Microbiology)
Baker Perkins, Ltd., 39, 351
  apprentices' hostel, 528
Bakery:
  Diploma course of training, 59
  Exhibition 1959, 54
Bakery (*continued*):
  Keillers', 51
  Macdonalds', 8
  Milanda, 209
  trade organisation, 58
Baking Industry (*annual review*), 54
Baluchistan, irrigation in, 63
*Bandit* biscuits, manufacture of, 5
Bantus, blood cholesterol of, 45
*Baring* biscuits, manufacture of, 297
Barley yield, 102
Batchelors:
  new factory in N. Ireland, 446
  new products, 38
Beans, canning of, 458
Beef:
  ageing process for, 311
  battery production, 198
  fat, yellow coloration of (abst.), 350
  production, 1958, 197
Beefburgers, production of, 56
*Belmalt* malting process, 103
Benzoic acid, determination of (abst.), 260
Beta-carotene, as colour, 72
Beverage, preparation and control (abst.), 526
Bibby animal feed factories (factory visit), 365
Biological testing station:
  *editorial comments*, 133, 177, 497
  proposals, 167, 305, 356, 489
Birds Eye:
  Kirkby cold store, 80
  Lowestoft cold store, 490
Birds, menace of (ed.), 499
Biscuits:
  Carr's new plant for, 338
  dog, 414
  production of by Macdonalds, 5
  production of in Kenya by Manji, 297
Bittering substances in hops, 103
Blackcurrant juice, detection of adulteration (abst.), 444
Blackpool Technical College, food technology extension 307
Boiled sweets, manufacture by Keillers, 51
*Bonderising*, 471
Bones:
  degreasing of, 320, 322
  gelatine manufacture from, 319
*Bonio*, 412
*Books reviewed*:
  Bionomics of Beetles of the family *Tenebrionidae* which occur in stored products (H.M.S.O.), 369
  Bulk Storage of Potatoes in Buildings (H.M.S.O.), 515
  Cheesemaking (H.M.S.O.), 112
  Dehydrated Vegetables for the Caterer (H.M.S.O.), 515
  Directory of Parent and Subsidiary Companies (Roskill), 202
  Directory of Trade Marks and Brand Names, 112
  Food Directory, 31
  Freezing Preservation of Foods—II (Tressler and Evers), 163
  Fremdstoffe in Lebensmitteln (Souci and Mergenthaler), 144
  Food Poisoning (Dewberry), 17
  Guide to the Identification of the Genera of Bacteria (Skerman), 254
  How to cook Rice (Howe), 53
  Infestation Control (H.M.S.O.), 69
  Inspection of Food (Thornton), 185
  Packaging Directory 1960, 392
  Packstoffe und Verpackungen, 284
  Potato Processing (Talburt and Smith), 112

*Books reviewed continued:*
Preservation of Fish and Fish Offal for Oil and Meal Manufacture (H.M.S.O.), 416
Principles of Nutrition (Wilson, Fisher and Fuqua), 328
Proceedings of the International Symposium on Enzyme Chemistry, 1957, 376
Skuse's Complete Confectioner, 71
Strontium 90 in Human Diet in U.K. (H.M.S.O.), 513
This Mushroom Business (Atkins), 208
Toilers of the Hills (Jones), 90
Vegetable Oils and Oilseeds (H.M.S.O.), 389
World Population and Food Supplies (Russell), 62
Bottles, contamination of, 155
Bowel obstruction by food (ed.), 46
Box making, at Keillers, 53
Brazil, Corn Products, new mill in, 532
Bread:
cooling of, 57
decline in consumption of, 149
improving P.E.R. of, 281
lysine supplementation of, 281
lysine supplementation of (abst.), 212
milk, 101
overweight (ed.), 498
roll production, 56
sales, review of, 54
sauce manufacture, 508
staling investigations, 57
supplementation with soya meal (abst.), 444
vitamin E in (abst.), 312
Breakfast cereals:
nutritive value of, 282
production by Latham Foods, 181
supplementation with lysine, 282
Brewing:
*annual review*, 102
convention in Rome, 102
Brewing, Bottling and Allied Trades' Exhibition, 422
British Baking Industries R.A., 57
a.g.m., 527
enrober survey, 447
British Industrial Biological R.A., 489
(*editorial comment*), 497
British Food Manufacturing Industries R.A., 307
presidential address (ed.), 315, 356
royal visit to, 265, 489
British Glues and Chemicals' protein process, attitude of T.G.W. Union to (ed.), 2
British Guiana, bulk sugar terminal in, 122
British Railways, Hither Green depot, 527
Broilers:
marketed by Mac Fisheries, 128
nomenclature, (ed.), 91
processing of, by Buxted, 229
spread of infection by (ed.), 92
Brown and Polson, Ltd.:
factory at Manchester (factory visit), 137
Irish factory, 38
Browning agent from whey, 101
Bulgaria, new lactic cheese in, 100
Bulk handling:
of flour, 54, 113
of sugar, 5, 122
Burma, jam jars in (ed.), 409
Bush, W. J., and Co., Ltd., new club, 528
Butter:
Australian work on storage of, 98
chemical "starters" for, 98
churn, new Czech continuous, 342
continuous machine for making, 98
continuous process for, in U.S.S.R., 22, 98
keeping quality of, 98
moisture content control, 98
spreading device for, 99
Butterscotch, manufacture by Keillers of, 52
Buxted Chicken Co., Aldershot, (factory visit), 229


## C


Cake mixes, production of, by Latham Foods, 181
Cake mixing, continuous, 56
*Cakeoma* cake mixes, production of, 181
Cake, pressed, from maize germ, 139
Calcium:
cyanamide, effect on peas of, 145
metabolism studies, 241
nitrate, effect on peas of, 145
phosphate, from gelatine manufacture, 323
Calorie requirements, 203
Cambridge, irradiation unit at, 393
Campden Research Station (ed.), 1
Canada, new sugar refinery in, 160
Canning:
anniversary celebrations, 82, 125, 332
by C.W.S., 504
by Lockwoods Foods, Ltd., 457
early methods of, 333
industry (ed.), 90
machinery (review), 334
150 years of, 332
original patent, 332
pears, 207
pears (corr.), 311
pet foods, 413
Canning and Freezing (*annual review*), 145
Cans, corrosion of, 147
Canthaxanthin, 72
Carbon cycle, in nature, 61
Carcases, chilling of (abst.), 350
Caries, dental, and confectionery, 12
Carp, farming of, in Uganda, 409
Carr's new biscuit plant, 338
Carrageheen extracts, 72
Carrots:
compression of dehydrated, 252
dehydration of, 249
flavour of dehydrated, 253
freeze drying of, 252
hot-air drying of, 251
phosphating of, 250
scalding of, 250
storage life of dehydrated, 252
sulphiting of, 250
Casein, new use for in Hungary, 101
Casings:
sausage, 235, 286, 402
(*see also* Packaging)
Cat food production, 413
Caterers, vices of (ed.), 318
Catering waste, 111
Cathodic protection, 470
Cattle:
Charollais, 198
Unilever studies on, 384
Caustic soda solution, contamination by, 155
Cellulose ethers, 74
use in ice cream, 60, 100
Centenary celebrations of pure food, 399, 445, 453, 488
Cereals:
α-amylase activity in (abst.), 260
breakfast (*see* Breakfast cereals),
remixing of (abst.), 483
storage problems from pests, 324
supplemented, 282
Ceylon, desiccated coconut, infected, from, 227, 317, 343
Changes in food habits, 149
Charollais cattle, 198
Cheddaring machine, continuous, 429
Cheese:
cloth, B.S.I. specification, 265
continuous draining and hooping, 99
fungicide for, 99
Italian production of, 210
irradiation of, 99
lactic, in Bulgaria, 100
mechanisation in U.S.A., 99
new varieties of, 100
waxing of, 99
Cheeses of Italy, 210
Chemical tests to solve growers' problems (ed.), 1
*Chemistry and Industry*, 403
Chicken processing by Buxted, 230
Chicken Information Council (ed.), 134
Chlorine as sanitising agent, 134
Chocolate:
handling of liquid, at Macdonalds, 6
manufacture of, at Keillers, 51
milk, standard for (ed.), 4
refrigeration equipment for, 296
*Chocolate digestive* biscuits, 9
Cholesterol:
and heart disease (ed.), 45, 455, 456
level in blood (ed.), 45
Christmas, a reflection (ed.), 500
Churn, new Czech continuous, 342
Churns, cleaning of, 156
359, 405, 452, 496, 534
Cinzano vermouth plant (factory visit), 390
Clarnico's transport arrangements, 90
Cleaning:
agents (ed.), 134
in-place (ed.), 133
Closures:
infection from, 156
(*see also* Packaging)
Clothing, protective, review, 114
Clove oil, 70
Cobalt irradiation unit at Cambridge, 393
Cocoa, prices, 11
Coconut:
desiccated (corr.), 343
desiccated, salm. infection of (ed.), 227, 317
Codes of Practice:
advisory committee, 402
for fish handling, 447
Cold storage (*see* Storage),
Colombo Plan students visit, 40
Colour, flavour and texture (review), 70
Colours, 70
B.S.I. analysis methods for, 267
Colworth House, 382
Committee:
food protection, suggested (ed.), 315
food standards (*see* Food Standards Committee),
Common Market (*see* European Common Market)
Commonwealth council of nutrition (ed.), 226
Company profits and prospects:
Albright and Wilson, Ltd./Boake Roberts, Ltd., 128
Beecham Group, Ltd., 128
Bowyers (Wiltshire Bacon), Ltd., 218
George Cohen 600 Group, 171
Heinz Co., 528
Henry Denny and Sons, Ltd., 216
Fitch Lovell, Ltd., 128
Horlicks, Ltd., 171
H.P. Sauce, Ltd., 218
Meredith and Drew, Ltd., 171
Procea, Ltd., 83
Remploy, Ltd., 83
Company profits and prospects (*continued*):
Ross Group, Ltd., 128
Simon, Henry, (Holdings), Ltd., 171
Simon Carves, Ltd., 171
United Glass, Ltd., 529
Van den Berghs and Jurgens, Ltd., 218
Companies, (*list of new*), 44, 88, 132, 176, 224, 270, 313, 359, 405, 452, 496
Conditions, legal, 298
Confectionery:
(*annual review*), 10
effect on teeth (ed.), 91
in schools (ed.), 91
industry, education in, 13
industry, Italian, 172
industry, international meetings, 14
industry, research in, 13
manufacture of, at Keillers, 51
manufacture in Poland, 237
sugar, use of glucose in, 476
Congress of Nutrition, Fifth International, 472
Constipation (ed.), 46
Consumer:
African, factors influencing (ed.), 408
preferences, 68
surveys, judging results, 69
Consumers' Association (ed.), 3
Containers:
cleaning of, 154
(*see also* Packaging)
Contamination during cleaning, 154
Control, automatic, at Macdonalds, 6
Conversazione at Royal Society, 81
Cooking, solar (ed.), 364
Cornflakes, production of by Latham Foods, 181
Coronary disease, and fats (ed.), 45 455, 456
Corrosion:
*editorial comment*, 454
Exhibition, 168, 273, 403, 454
Exhibition review, 467
inhibitor, fortuitous, 177
inhibitor, fortuitous (corr.), 385
inhibitor in dough (ed.), 177
of aluminium (abst.), 312
of cans, 147, 483
preventers etc. (*see under* Machinery and Equipment)
prevention, 462 *et seq.*
Couverture, milk standards for (ed.), 4
Cover, polythene, for cannery lagoon, 268
*Cracka-Jack* cornflakes, production of, 181
Cream:
damage to, by freezing (abst.), 123
homogenisation of, 98
storage, 98
*Creamed Rice*, 460
Crosses of beef and dairy cattle, 197
Crumb softness, 58
Crumpet improver, 74
Cultivation, total land available for, 62
Cumbernauld new town, 170
Curd separation, 99
*Current Food Additives Legislation*, 453
C.W.S. Preserve Works, Reading (factory visit), 501
Czechoslovakia, new continuous butter churn in, 342


## D


Dairy, Milan's municipal (factory visit), 432
Dairy Products (*annual review*), 97
Dairy show, 351
*Dariworld*, 100
Deception in food (ed.), 316, 410
Dehydrated foods (ed.), 135
Dehydration:
of carrots, 249
of potato products (abst.), 33
Denmark, food fair in, 131
Dental caries, and confectionery, 12, 91
Desert irrigation (ed.), 47
Desiccated coconut (*see* Coconut)
Detergents, 158
Detergents and sanitisers (ed.), 134
Dextrines, 144
Dextrose manufacture, 143
Diacetyl determination, 123
Dichlorodimethylhydantoin, 134
Diet:
and health (ed.), 45
effect on, of amino acid supplementation, 283
Diets, adequate, 148
Dietary:
patterns, regional, 149
supplementation, effect on growth, 289
trends, 149
Dietetics, International Congress of, 306
Disinfectant evaluation (abst.), 483
Dispensing of aerated liquids (pat.,), 44
Docks, food handling regulations at, 447
Doctors of Philosophy, substandard (ed.), 226
*Domaker* process, 55
Dominican Republic, banana processing in, 85
Dough:
as corrosion inhibitor, 177
mechanical development of bread, 492
mixing, 55
mixing, automatic, at Carr's factory, 340
Doughnut production, 57

Douglas, William, Ltd., acquired by Baker Perkins, 39
Drinks, whole orange, standards for (ed.), 363
Drying:
accelerated freeze (*see* Freeze drying)
foam mat, 153
*Dundee Cake*, Keiller's, 51
*Dundee Shortbread*, Keiller's, 51
Durand, Peter, original patent of, 332


## E


Eastbourne trading estate, 81
Eating, hazards of (ed.), 46
Edible protein from grass (ed.),
Education:
in bakery industry, 58
in confectionery industry, 13
Effluent disposal (ed.), 272
Egg:
dried, British, 124
frozen, in pickles, 15
frozen, paratyphoid from (ed.), 363
liquid, freezing of, 279
liquid, pasteurising of, 278
liquid, processing of, 277
protein efficiency ratio of, 280
Eggs:
automatic handling of by Rannochs, 275
baking quality (abst.), 260
breaking out of, 277
grading of, 276
paraffin coated (abst.), 78
prepackaging proposals for, 264
remote counting of, 276
Emulsifiers, 73
ice cream, 60
Energy requirements of body, 148
Enhancers, flavour, 71, 147
Enzymes:
activity in foods, 147
flavour enhancing, 147
fungal, 58
Essences, flavouring, 70
Essential oils, 71
Ethylene oxide for sterilisation (abst.), 444
European Common Market, 357
(*editorial comment*), 272
European Free Trade Association (ed.), 272
Executives, failures among (ed.), 318
*Exhibitions*:
ANUGA 1961, 222
Brewing, Bottling and Allied Trades', 167, 422
Corrosion, 168, 273, 403, 454
Corrosion (review of), 467
Food Fair, 216, 398
Fresh Food Packaging, 399
Ideal Home, 125
Interpack, 85
Mechanical Handling, 186
Pure Food Centenary, 399
Experimental factory at Aberdeen, 351
director's resignation, 448
decision to close (ed.), 180


## F


*Factory visits*:
Bibby, J., and Sons, Ltd., 365
Brown and Polson, Ltd., Manchester, 137
Buxted Chicken Co., Ltd., Aldershot, 229
Cinzano, (Italy), 390
C.W.S. Preserve Works, Reading, 501
Keillers, Ltd., Dundee, 49
Latham Foods, Ltd., Bromborough, 181
P. Leiner and Sons, Ltd., Treforest, 319
Lockwoods Foods, Ltd., Long Sutton, 457
Macdonalds, Ltd., Glasgow, 5
Mac Fisheries, Ltd., Frazerburgh, 93
Mason, George, and Co., Ltd., 506
Milan Municipal Dairy (Italy), 432
Rannoch, John, Ltd., Haughley Park, 275
Richmond Sausage Co., Ltd., Evesham, 285
Spratt's Patent, Ltd., Liverpool and Wisbech, 411
Wall, T., and Sons (Meat and Handy Foods), Ltd., Willesden, 233
Farming efficiency, 63
*Fairtry III* trawler, 80
Fat, determination of (abst.), 260,
Fats:
and heart disease (ed.), 45, 455, 456
handling, at Macdonalds, 6
hundred years of (ed.), 271
hydrolysis of, 386
prices of, 11
research by Unilever, 383
storage of, in U.S.S.R., 22
Fermentation, continuous, 104
Fertilisers:
natural, 64
power requirements, 64
Fibre, maize, 138
Filtration of beer, 106
Finings in brewing, 105
Fish:
annual catch (ed.), 273
browning of preserved (abst.), 261
catching by electricity (ed.), 274
depot, Mac Fisheries' Finsbury Park, 435
farming, 107
farming, in Uganda (ed.), 408
filleting, 94
freezing of, in U.S.S.R., 19
handling, codes of practice for, 447
handling, F.A.O. urges improved, 532
marketing of, by Mac Fisheries, 407
preservation by irradiation (abst.), 444
processing at Mac Fisheries, 93
processing in Poland, 238
processing of, in U.S.S.R., 20
rapid thawing method, 352
resources, world (ed.), 274
Russian research into, 18
smoking, 94
spoilage (abst.), 261
sticks, 96
storage of, in U.S.S.R., 19
white, supply in 1959, 446
world yields of, 107
Fisheries:
expedition, 353
world, problems of (ed.), 273
Fishmeal as food, 108
Flavour:
assessment of, 67
chicken (corr.), 79
improver from whey, 101
judging of, 66
judging of (corr.), 213
preferences, 67
research by Unilever, 383
Flavour, colour and texture (review), 70
Flavours, 70
Flavours, pesticide effects (abst.), 33
Floors, hygienic, 174
Flour:
air classification of (abst.), 212
bulk handling of, 54, 113
handling by Carrs, 338
handling by Tote system, 113
impact milling of, 55
oil content of (abst.), 260
quality of, 55
Fluidisation of sawdust, 417
Fluorine in food regulations, 80
Fodder, raw, conversion of (pat.), 44
Food:
additives, 70
additives (ed.), 410
adulteration of, in Italy (ed.), 48
animal (*see* Animal Feeds *and* Pet foods)
antioxidants for, 446
arsenic limits in, 12
biological value of, 280
bowel obstruction by (ed.), 46
by transformation of unsuitable materials, 108
can it be too refined? (ed.), 46
cat, 411
choice of, 148
clean, legal aspects of, 427
colour, B.S.I. standard, 216
colours, 70
composition of, 148
consumption in U.K., 443
deception (ed.), 316, 410
dehydrated (ed.), 135
dehydrated, Unilever research on, 384
enzyme activity in, 147
Fair, 216, 398
fats in last 100 years (ed.), 271
flavour research by Unilever, 383
flavours, 70
for pets, (ed.), 136
from algae, 109
from leaves, 109
from unusual sources (ed.), 316
frozen, in U.S.A., 410
frozen (*see also* Freezing)
fumigation of, 324
habits, changes in, 149
handling regulations at docks, 447
hygiene regulations, 447
in hospitals (ed.), 274
in Poland, 237
indigenous (*see* Indigenous foods)
irradiation (*see* Irradiation)
lead limits in, 12
legislation, history of, 479
losses through waste, 110
nitrogen balance of, 282
nutritive value of, 280
pest problems in, 324
pet (ed.), 136, 409
pet, manufacture by Spratt's, 411
pet, Japanese (ed.), 409
preferences, 67
preservation of (ed.), 1
preservatives in, Food Standards Committee's proposals, 38
processing damage to, 282
refined, change to, 150
regional patterns, 149
research centre, Unilever, 382
science, 216
science (ed.), 362
social habits in, 68
spoilage assessment, 386
Food (*continued*):
spoilage research by Unilever, 382
synthesis, 109
synthetic (ed.), 316
technologists, discussion on (ed.), 361
testing station proposal (ed.), 133, 177, 316, 497
testing station proposals, 167, 305, 356, 489
texture improvers, 70
vending by machine (ed.), 225
world sources of, 61, 107
world supplies, 61, 107, 148, 290
world requirements, 288, 290
Food Advisory Committee, 264
Food and Agricultural Organisation, U.N., 62, 329
Food Group, S.C.I.:
discussion on technologists (ed.), 361
hundred years of food fats (ed.), 271
overseas tour, 315, 316
Food in Parliament, 40, 168, 266, 305, 356, 400
Food Machinery Association, 305
*editorial comment*, 272
Food poisoning, 17
in 1958, 40
Food protection committee, suggested (ed.), 315
Food Standards Committee, 305
report on preservatives, 38
Food Testing Research Association, 133, 167
Food yeast production, 109
Foodtech, Ltd.:
new premises, 84
new machine, 168
Formosa, food yeast plant in 515
France, sour milk product in, 101
Frankfurters, cooking of (abst.), 483
Frazerburgh fish factory, 93
Freeze drying:
accelerated (ed.), 135
equipment for, 293
equipment for (abst.), 260
Freezing:
effect on packaging (abst.), 33
liquid nitrogen use in (abst.), 312
of chickens, 231
quick, equipment for, 295
with liquid nitrogen, 430
Freezing and canning (*annual review*), 145
Freezing and refrigeration equipment review, 293
Fruit:
canned, Australian prospects (ed.), 2
canned, from U.S.A. (ed.), 3
canned, in the Far East (ed.), 3
canned, South African prospects, 2
canning by C.W.S., 504
canning by Lockwoods, 457
chemical composition, 145
processing in Poland, 238
pulping by C.W.S., 504
quick frozen, 1959 production, 307
whole fresh, definition (ed.), 363
Fruit and Vegetable Canning and Quick-Freezing R.A. (ed.), 1
Fruit chips, made at Keillers, 50
Fruit juice, use in milk drinks, 98
*Fruit Salad*, 460
Fumigants, 159
Fumigation:
of food, 324
of maize (abst.), 174
Fungal enzymes, 55, 58
Fungicide for cheese, 99


## G


Garton, new glucose factory, 514
Gas packing, 420
Gelatine:
manufacture by Leiners, 319
standards for, 12
uses of, 320
General Mills, Inc., 181, 182
Germ:
of maize grain, 138
processing, 141
separation, 139, 141
Germ oil, 139
Germany, dried milk product in, 10
Ghana, Volta River plan, 63
Gibberellic acid, use in malting, 102
Glamour and food processing (ed.), 408
(*correspondence*), 519
Glasses, washing of, in public houses (ed.), 48
*Glengarry* biscuits, manufacture of, 5
Gloves, protective, 117
Glucose:
classification, 476
in sugar confectionery, 476
manufacture, 143
production by Gartons, 514
refining plant, Brown and Polson's, 137
solid, 143
syrup, handling of at Macdonalds, 7
Gluten, 137
feed, 141
meal, 141
separation from starch, 141
Grain:
losses from stored (ed.), 362
storage problems from pests, 324
Grape processing by Cinzano, 391
Grinding (*see* Milling)

Grits, 184
Growers' problems, will chemical tests solve? (ed.), 1
Growth, effect of dietary supplements on, 289
Gust (unit of taste measurement), 66

## H

Habits, food, changes in, 149
Ham, assessing quality of (abst.), 350
Hamburgers, production of, 56
Hazards:
  of eating (ed.), 46
  of pesticides (ed.), 89
Haze formation, non-biological, 105
Heart disease, and fats (ed.), 45, 455, 456
Heating, infra-red, 294
Heinz:
  donation to Tate Gallery (corr.), 419
  new research centre, 217
Herbs, use in vermouth manufacture, 391
Herring, processing of, 94
Holland:
  dairy association report, 404
  land reclamation in, 62
  new cheese variety in, 100
  suspect margarine in, 493
  suspect margarine in (ed.), 407
Homogenisation of cream, 98
Honeywell Controls, Ltd., 520
Hops:
  factors affecting utilisation, 103
  storage of, 104
Hormone feeding of animals, 198
Horsemeat, 134
Horticultural research by Unilever, 384
Hospitals, food in (ed.), 274
Hungary:
  casein product in, 101
  tomato investigations in, 145
Hunger, meanings of, 327
Hydro-cooling:
  equipment for vegetables, 296
  of watercress, 436
Hygiene, 154
  aids (review), 158
  efforts, how they are frustrated (ed.), 499
  in chicken factory, 232
  in factories (ed.), 134, 180
  in public houses (ed.), 48
  in sausage factory, 236
  need for (ed.), 91
  regulations, 447
  vending machines and, (ed.), 225

## I

Ice cream:
  consumption, 59
  diabetic, 100
  emulsifiers and stabilisers, 60, 100
  food value of (ed.), 92
  industry (*annual review*), 59
  new stabilisers, 100
  regulations, 59
Ideal Home Exhibition, 125
Improver, flavour, from whey, 101
Improvers, 73
India:
  biscuit and confectionery production in, 131
  wheat experiments in, 61
Indigenous foods:
  importance of, 150
  in Australia, 152
  in Central and S. America, 150
  in S. Africa, 151
Indole in spoilage measurement, 388
Inefficient packs (ed.), 453
Infection during cleaning, 154
Inks on printed wrappers (ed.), 179
In-place cleaning (ed.), 133
Insects:
  depredations of (ed.), 362
  in food, 325
Insecticidal sprays, dangerous (ed.), 48
Insecticides, 159
International Congress of Food Science and Technology, 1962, 445
International Seed Crushers' Congress, 402
International standards for pure food (ed.), 453
International Whaling Commission (ed.), 4
Interpack, 1960, 85
Iodophors, 134
Irish moss extract, use in milk drinks, 98
Irradiation:
  European information centre for, 450
  of food (corr.), 213
  of food, the end? (ed.), 135
  of spices and teas (abst.), 526
  preservation of fish (abst.), 444
  unit at Cambridge, 393
Irrigation of deserts (ed.), 47
Isinglass finings in brewing, 105
Israel, land development in, 63
Italy:
  adulteration of food in (ed.) 48
  cheeses of, 210
  Cinzano vermouth production (factory visit), 390
  confectionery industry expansion, 172
Italy (*continued*):
  contaminated milk in Naples (ed.), 1
  frozen food in (ed.), 315
  land reclamation in, 62
  meat consumption in, 404
  Milan's municipal dairy (factory visit), 432
  pea varieties in, 146
  tomato varieties in, 145

## J

Jacob, W. R., and Co., factory extension, 306
Jam:
  jars in Burma (ed.), 409
  manufacture by C.W.S., 502
Japan:
  canned ham from, 317
  pet food manufacture in (ed.), 400
Javanese, blood cholesterol of, 45
Jelly manufacture by C.W.S., 504
Jellies, how Keillers make, 50
Jones, Samuel, and Co., 150th anniversary, 307
Judgment of flavour, 66
Juice, fruit, use in milk drinks, 98

## K

Kajansi fish farm, 408
Keillers of Dundee (factory visit), 49
Kenya:
  bakery in, 357
  biscuit manufacture by Manji, 297
  dairy plant, 450
  produces condensed milk, 532
  tea development in, 310
Ketchup, tomato, 15
Kippers, production of, 94
Knockmore factory, Bibby's, 365
Kwashiorkor, 205

## L

Labelling machines (*see* Machinery and equipment)
Labels (*see* Packaging)
Lactic acid bacteria in brewing, 106
Lakes and rivers, food from, 107
Lamb, 1959 prices, 199
*Lancet, The*, and food adulteration, 480
Latham Foods, Ltd. (factory visit), 181
Law, manufacturers and the, 298, 427
Lead, limits of in food, 12
Leaves as sources of food, 109
Legislation, food, history of, 479
Leguminous plant cultivation, 65
Leiner's gelatine factory (factory visit), 319
Livestock, losses through disease, 65
Lockwoods Foods, Ltd. (factory visit), 457
Long Sutton cannery, 457
Losses of food through waste, 110
Low Temperature Research Station, irradiation unit at, 393
Luncheon meat (ed.), 136
Lycopene, 72
Lysine:
  fortification of food, 280
  supplementation of bread (abst.), 212

## M

Macdonalds of Glasgow (factory visit), 5
Mac Fisheries, Ltd.,
  Finsbury Park depot, 407, 435
  Frazerburgh (factory visit), 93
Machines:
  the workers' angle, 330
  uses for other than food (ed.), 177
Machinery, exports of (ed.), 272
Machinery and equipment:
  actuators and controllers, 191, 248
  air classifier, 28
  air conditioning plant, 345
  aluminium treatments, 471
  antifoam compound, 214
  ash extractor, 166
  autoclaves, 520
  automation devices (review), 243
  baking controls, 521
  bag flattener, 120
  bag stretcher, 346
  bearings, 193
  bearings, oil-free, 347
  board machines, 75
  boilers, package, 412, 484
  bottle washers, 423, 424, 512
  bread cooler, 57, 58
  brewing control system, 396
  brewing plant, continuous, 422
  bulk handling installation, 243
  butter churn, continuous, 342
  butter-making machine, continuous, 98
  butter spreading device, 99
  butter wrapping machines, 378
  cage unloader, 413
  can cleaner, 425
  can dryer, 337
Machinery and equipment (*continued*):
  can forming machines, 336
  canning machinery (review), 334
  cans, flattened, 337
  cap lining machine, 379
  capsule labelling attachment, 397
  carbonating plant, 423, 425
  carton clincher, 522
  carton erecting and closing machines, 520
  carton former, 378
  carton sealer, 166, 375
  carton wrapper, 523
  casing clipper, 380
  casing stuffer, pneumatic, 380
  ceiling, illuminated, 396
  cements, corrosion resistant, 467
  centrifuge, 395
  chains, driving and conveying, 189
  checkweigher, 378, 439
  cheddaring machine, continuous, 429
  chocolate refrigeration, 296
  cleaner, tank, 512
  cleaning, automatic in-place, 422
  cleansing agent, 264
  closing machines, can, 337
  clothing, protective, 484
  coatings, corrosion resistant, 467
  coding machine, 335
  colour matching unit, 165
  computer, process control, 438
  container, collapsible, for beverages, 259
  containers, alloy, 190, 191
  containers, polypropylene, 522
  conveyor, feed, 522
  conveyor, vibratory, 120
  conveyor and screen, 300
  conveyors, 187, 300, 423, 440
  conveyors, pneumatic, 187, 194, 196
  cooker, continuous, 335, 336
  cookers, meat, 394
  coolers, 423, 425
  corrosion preventers, 467
  counters, electronic, 439
  cranes, 187, 193, 196
  crating machines, 424
  data logging equipment, 440
  deodorising plant, 510
  detergents, 423
  disintegrator, 28
  dispenser, fat, 121
  dispensers for cleaning materials, 157
  doors, flexible, 522
  drives, rope, 440
  drives, wedge belt, 485
  drum, motorised conveying, 194
  drum stacker, 76
  dryer, electric, 165
  dryer, flash, 522
  dryer, roller, 510
  dust collection plant, 164, 188, 214, 257
  egg handling plant, 276
  egg freezing plant, 279
  egg pasteurising plant, 278
  egg tanker vehicle, 402
  ejector for labeller, 347
  elevator, 190, 367
  elevator, screw, 214
  elevator and tipper, 346
  emulsifier for pickles and sauces, 16
  evaporator, plate, 509
  evaporator, rotary concentrating, 485
  evaporator, triple-effect, 76
  fan, 121
  feeder for difficult materials, 256
  feeder, volumetric, 520
  feeders, constant rate, 366
  filler, aseptic, 512
  filler, can, 337, 413
  filler for hygroscopic powders, 440
  filler, sack, 188
  filler, vacuum, 119
  fillers, 118, 336, 377, 422, 423
  fish freezing plant, 95
  fish salting machine (Russian), 18
  fish smoking plant, 95
  floor dressing, 397
  floor maintenance machine, 301
  flooring material, 468
  flow controllers, 77, 245
  flowmeter, 257, 394
  fog generator, 441
  folder-gluer, 301
  foos mills, 140
  freeze drying, 293
  freezing equipment review, 293
  freezer, plate, 295
  gears, 187, 188, 248
  glaze, plastic, 467
  gloves, protective, 215
  graders, precision, 394
  grain suction plant, 368
  granulators, rotary, 345
  grinding machines (review), 24
  harvesting, machines, 335, 336
  heater, air, 36
  heating, infra-red, 294
  heating mantle, laboratory, 347
  hoists, 193
  homogeniser, 510
  homogeniser, ultrasonic, 17
  hydroclones, 141
  ice cream cup filler and capper, 376
  ice cream freezer, 60

Machinery and equipment (*continued*):
jar packer, 300
label dispensers, 397
labeller, automatic bottle, 520
labeller, thermoplastic, 380
labelling machines, 257, 345
labelling, self-adhesive, 343
laminated plastic fabrications, 472
level controller, 256
level gauge, 189
level indicator, bin, 522
lifter and tipper, 119
lifters, 190
light fittings, 215
liquid blender, 441
liquid meter, 394
mechanical handling machinery, 186
metal detectors, 247, 301, 345
metal treatments, 468
milk presteriliser, 433
milk processing machinery (review), 509
milk stassaniser, 433
mill, ball, 24, 26
mill, cocoa liquor, 24
mill, comminuting, 24, 28
mill, impact, 29
mill, pin-disc, 27, 29
mill, roller, 29
milling machines (review), 24
mixer, continuous dough, 36
mixer, high-speed dough, 6
mixer for pickles and sauces, 16
mixer, portable, 256
mixers, continuous, for bread and cake, 55
mixing valve, 35
motors, 186, 248
moulding plant, 9
nibber, nut, 25
oven, pastry, 34
ovens, biscuit, 414
package monitors, 246
packaging machines, 258, 301
packaging machines, (review), 377
packer, 336
packer, high speed bag, 521
paints, corrosion resistant, 467
paints, fungicidal, 424
pallet loader, 119
pallets, 194
paper sack system for refuse, 34
passenger carrier, electric, 77
pasteuriser, beer, 422
pasteuriser, H.T.S.T., 509
*p*H meter, 259
pipes, thermoplastic, 469
pipeline heaters, 246
plastic coatings, 470
plucking machine, 230
polythene boxes, 256
potato freezing plant, 118
potato ricing machine, 255
poultry processing plant, 76, 232
printer, high speed, 438
process controllers, 244
proportioning unit, 195
pulveriser, 26
pump, for pressure washing, 425
pump, for solids, 118
pump, for viscous fluids, 34
pump, glass, 166
pump, powder, 192
pumps, 190
pumps, centrifugal, 441
pumps, valveless, 120
punched card automatic systems, 244
purifier (flour), 29
quick freezing equipment, 295
quill-pulling machine, 230
receptacles, fibreglass, 214
recorder-controllers, 396
recorder, transistorised, 259
refrigeration equipment review, 293
refrigeration in chicken factory, 231
registration device, electronic, 36
roof, 475
rust removers, 467
sack loader, 439
sack truck, 35
sausage filler and linker, 164
sausage machines, 168, 202, 236, 258, 334
scale remover, 467
screen and conveyor, 300
seal, split mechanical, 259
seamer, 336
scone plate, 34
screen vibratory, 120
separator, magnetic, 441
shear, scroll, 215
shunting machine, 196
sifter, 29
silicone rubbers, 395
size reduction machines (review), 24
skinless sausage machine, 235
smoke generator, 417
spaghetti machine, 400
sprayer, 493
stackers, 188, 194, 195
stalking and washing machine, 215
starch separators, 141
steam traps, 259
steriliser, high temperature, 509
strapping machine, pneumatic, 300
strapping material, 397
Machinery and equipment (*continued*):
strip-packaging machine, 215
suction cleaner, 258
sugar plant, 244
tanks, farm, 510
tape, pipe identifying, 164
tape, protective, 521
tapes, self-adhesive, 121, 165, 469
temperature controller, 34, 214, 258, 485
temperature detector, 166
tenderometer, 335
texturemeter, 335
thermocouples, pipe, 120
thermometer spear, 76
tipper, 195
transmission unit, 395
trolley, 396
truck, trailer, 196
trucks, 186, 191
trucks, fork lift, 190, 191, 192, 196, 424
vacuum and gas packing machine, 379
valve, glass, 119
valve, sleeve, 192
valve, thermostatic mixing, 246
valves, diaphragm, 471
valves, feeder, 439
valves, power-operated, 300
valves, stainless steel, 422
valve actuator, electric, 121
van loading, 306
vegetable peeler, 334
vehicle, bulk carrying, 35
vehicle, bulk flour transporter, 258
vehicle, commercial, 126
vehicle, egg tanker, 402
vehicle, transporter, 195
vehicles, container handling, 120
vehicles, refrigerated, 521
ventilator, 347, 468
ventilator, powered, 396
vining machines, 336
water softener, portable, 395
*Votators*, 475
weighing, automatic, by load cells, 511
weighing machines, 193
weighing systems, automatic, 244
wrapping machines, 164, 214, 378
Maize:
cornflake manufacture from, 183
degerming, 184
grain, composition of, 138
milling of, 139, 184
oil, 139
processing by Brown and Polson, 140
starch, 138
Malaria, elimination of, 62
Malaya:
canned pineapple from (ed.), 2
condensed milk manufacture in, 310
Malnutrition, definition of, 328
Malt:
detection of (abst.), 260
extracts, 426
modification of, 102
Malting:
loss, 102
new techniques, 103
Manji biscuit factory in Kenya, 297
Margarine:
factory, Stork, 474
industry, foundation of, 271
industry, rise of (ed.), 271
production of, in U.S.S.R., 23
suspect, in Holland, 493
suspect, in Holland (ed.), 407
Marketing, revolution in (ed.), 407
Marmalade:
how Keillers make, 49
manufacture by C.W.S., 504
Marshmallows:
exploding (ed.), 135
manufacture of, at Macdonalds, 8
Mashing, continuous, 104, 422
Mason, George, and Co., Ltd. (factory visit), 506
Massachusetts Inst. of Technology, enlarges food dept., 533
Materials, uses for other than food (ed.), 177
Materials handling (ed.), 178
Mayonnaise, 15
M.B.T. Frozen Foods, Ltd., new cold store, 305
Meat:
(*annual review*), 197
connective tissue in, determination of, 123
consumption in Italy, 404
dehydrated, for Antarctic expedition, 39
dishes, frozen, (abst.), 78
effect of cooking temperature on (abst.), 261
flavouring of freeze-dried (ed.), 455
hydrolysis of, 386
inspectors, new qualifications for, 445
irradiation preservation of, 201
luncheon (ed.), 136
market, 202
*p*H of, 387
porosity of freeze-dried (ed.), 455
post mortem changes in, 386
preparation of, by Richmond Sausage Co., 286
processing in Poland, 238
refrigeration plant for (abst.), 444
research by Unilever, 383
spoilage, laboratory assessment of, 386
Meat products, bacteriological tests (abst.), 79
Mechanical handling (ed.), 178
Mechanical Handling Exhibition, 186
Methyl bromide, 159
Mexico:
food investigation in, 150
nutrition survey in, 288
sugar production in, 30
Microbiology of brewing, 106
Microbiological research by Unilever, 382
Milan's municipal dairy (factory visit), 432
Milanda bakery opening, 209
Milk:
bottling, in Italy, 434
bread, 101
Cook committee proposals for, 491
dried, 100
dried, fat content of (abst.), 123
flavoured, in Italy, 432
flavourings for, 97
frozen, 97
in couvertures, standard for (ed.), 4
international code of principles for (ed.), 453
pasteurising in Italy, 433
powder, instant, 101
processing equipment (review of; *see also* Machinery and equipment), 509
processing in Milan dairy, 432
radioactive (ed.), 4
regulations, 448
research on, during 1959, 97
sodium hypochlorite in (abst.), 260
sour, product from, 101
stassanising, 433
sterilisation in Italy, 433
strontium 90 removal from (ed.), 4
vending, automatic (ed.), 225
Milk areas, designated, 266
Milk chocolate, standard for (ed.),
Milk products:
imports of, 305
stabilising flavour of, 130
Mills, Bibby's animal feed, 366
Milling:
of flour, 55
of rice, new technique, 248
wet, of maize, 139
Mineral Water Engineers' Association, 219
Mixing:
biscuit dough, at Macdonalds, 6
cake mixes, 183
doughs, continuous, 56
in pickle and sauce manufacture, 16
Molasses, use in yeast production, 516
Monosodium glutamate, 71
Morocco:
canning celebrations in (ed.), 1
food poisoning in (ed.), 1
ploughing methods, 61
*Munchmallow* biscuits, manufacture of, 5
Mushrooms, growing of, in New Zealand, 85


## N


National Association of Master Bakers, 58
National College of Food Technology, 124
Netherlands (*see* Holland)
New companies (*see* Companies)
Newman Labelling Machines, Ltd., 351
New Zealand:
continuous brewing in, 104
ice cream production, 451
meat exports, 200
mushroom growing in, 85
Nigeria:
biscuit factory in, 310
cocoa prospects, 43
nutrition survey in, 288
nutritional investigations in, 240
N. Ireland:
Batchelors' new factory in, 446
Bibby's factory at Knockmore, 365
Nisin, 146
proposal for, as preservative, 38
Nitrogen:
balance of foods, 282
cycle, in nature, 61
fixation in soil, 65
liquid, freezing with, 430
liquid, use in freezing (abst.), 312
Noise:
nuisance of, 330
nuisance of (ed.), 178, 316
Norfolk County Protection Committee (ed.), 4
Nutrients, interrelationships of, 241
Nutrition:
and population problems (ed.), 46
animal, 65
council in Commonwealth (ed.), 226
knowledge of, 63, 328
principles of, 148
problems of, 290
requirements, 203, 240
Nutritional value, reduction by milling, 150
*Nylon*:
for protective clothing, 115
use in preventing haze, 105


## O


Obesity:
in children (ed.), 364
problem of ,290

Oils, essential, 71
*O.K.* sauce and pickle manufacture 506
Olive oil, adulterated, in Italy (ed.), 48
Orange drinks, standards for (ed.), 363
Ossein, production of, 321
Ovens, solar (ed.), 364
Overalls, 114
Overeating, a hazard (ed.), 45
Ozone treatment of cold store air (abst.), 312

## P

Packaging:
- aerosols (*see* Aerosols)
- aluminium corrosion (abst.), 312
- aluminium foil, 372
- baby food pack, 302
- bacon pouches, plastic, 37
- bacon wrapping material, 376
- bands, self-adhesive, 525
- biscuit wrappers, 263, 302, 304, 349, 381
- board, untreated, for cartons, 211
- boilable packs, 211, 262
- bottles, coloured, for fruit drinks, 348
- brand image design, 37
- bread pack, 211
- bread wraps, polythene, 371
- cake pack, 263
- can tray, 87
- canned sauce packs, 381
- carton for bread rolls, 442
- cartons, heat-sealable, 374
- cartons, polythene, for frozen food, 348
- casings, cellulose, 217, 402, 486
- cellulose films, opaque, 370
- cellulose films, transparent, 370
- chicken pack, 486
- closures, bottle, 375, 444
- coated material, 302
- coffee pack, 442
- collapsible tubes, 304
- collapsible tubes, polythene, 487
- confectionery packs, 381
- containers, polythene, 381
- cups, disposable plastic, 263
- display card, 348
- double pack, 262
- effect of freezing (abst.), 33
- fibrous casings, 376
- film, cushioned polythene, 524
- fish packs, foil stiffeners for, 349
- flour bags, 525
- flour cartons, 486
- foil pouches, 524
- foil wrapper for sausage meat, 487
- frozen food, 147, 262, 303, 348
- frozen pea pack, 302
- glass container sales in 1959, 169
- glassine, 376
- ham packs, 486
- high-gloss wrappers, 175
- methcient (ed.), 453
- jam, can for, 348
- jar, polythene, 304
- kippers, 95, 381
- labels, anti-stick finish for, 214
- labels, for canned food, 348
- labels, self-adhesive, 443
- machines (review), 377
- margarine, foil carton for, 349
- materials (review), 370
- meat overwraps, 375
- merchandising unit, 487
- metallised film, 375
- metallised papers, 375
- mustard packs, foil, 525
- nylon films, 371
- oat bread wrapper, 37
- papers, 376
- paper sacks, polythene lined, 303
- parchment, 376
- parchment, imitation, 376
- pie pack, 87
- plates, disposable plastic, 37
- polyester film, 373, 374
- polypropylene films, 371, 373
- polystyrene bottles, 175
- polystyrene films, 371
- polythene, unsupported, 129
- polythene film for fish, 87
- polythene films, 371
- pot, plastic, 129
- potato crisp pack, 443
- p.v.c. films, 371
- salt pack, 524
- seals for bottle closures, 375
- shrinkable film, 487
- soup packs, 87
- stoppers, plastic top, 375
- stoppers, polythene, 524
- tapes, adhesive, 372
- tapes, gummed sealing, 442
- tea pack, 303
- toffee tin, 303
- transparent film, coded, 303
- transparent film packs, 175
- vacuum-formed packs, 373
- vacuum packs for frozen food, 170
- vacuum packs for sausages, 443

Packaging Centre, 400
Packaging machines (*see* Machinery and equipment)
Packing, gas, 420
Paint (*see* Machinery and equipment)
Paperboard, odour, 11
Parasites, beware of (ed.), 409
Paratyphoid, outbreak of (ed.), 363
*Parkerising*, 471
Passengers' Protection Association (ed.), 90
Pasteurising of liquid egg, 278
Pastry production, 56
Patents (*list of recent*), 44, 88, 176, 224, 313, 359, 405, 452, 495, 534
Peaches, canned, from South Africa (ed.), 2
Pears:
- Bartlett, 208
- canned, from Australia (ed.), 2
- canning of, 207
- canning of (corr.), 311
- Conference, 207

Peas:
- calcium absorption by, 146
- canning of, 458
- effect of fertilisers on, 145
- processed, 146
- texture of, 146
- varieties of, in Italy, 146
- vining of, in U.S.A. (ed.), 410

Pectin, preparation of (abst.), 123
Peels, syruped and candied, production by C.W.S., 505
Pellagra, 289
*Penguin* biscuits, manufacture of, 5
Penicillin, and meat pie (ed.), 364
*Pepsi-Cola*:
- advertisement (ed.), 227
- publicity campaign (ed.), 500

Perch, farming of, in Uganda, 409
Pest destruction in U.S.A. by h/f radiation, 43
Pest problems, 324
Pesticides:
- effect on flavours (abst.), 33
- hazards of (ed.), 89, 227

Pet foods (*see* Foods, pet)
Pickle:
- and sauce manufacture by Geo. Mason, 506
- production by C.W.S., 505

Pickles (ed.), 410
Pickles and sauces (*annual review*), 14
Pie, meat:
- mouldy (ed.), 364
- manufacture by Richmond Sausage Co., 285

Pig:
- fat determination by ultrasonics (abst.), 483
- fodder, aureomycin addition to (abst.), 483
- Wall's heavy, 234, 361
- Wall's progeny testing station for (ed.), 271, 361
- Unilever research on the, 385

Pineapple, canned:
- from Australia (ed.), 2
- from Malaya (ed.), 2

Plating, 472
Poland:
- fish processing in, 238
- food machinery in, 237
- new fisheries port in, 239
- work on chemical starters for butter, 98

Polythene:
- for protective clothing, 117
- use in soil-reclamation (ed.), 47

Ponceau colour, 72
Population:
- problems (ed.), 46
- problems and estimates, 473
- world, distribution of, 290

Post mortem changes in meat, 386
Potato:
- introduction to Europe, 149
- flake, instant mashed, production of, in Canada, 255
- products, dehydration of (abst.), 33

Poultry:
- processing of, by Buxted, 229
- spoilage of (abst.), 350

Poverty, and disease, 328
Preferences, studies of, 67
Prepackaging, effect on bacon (ed.), 271
Preservation of food (ed.), 1
Preservatives, Food Standards Committee Report on, 38
Printing inks and wrappers (ed.), 179
Programming of recipes at Carr's factory, 340
Propionic acid, proposal for, as preservative, 38
Protection committee, suggested (ed.), 315
Protective clothing, review, 114
Protein:
- amino acid composition, 281
- biological value of, 281
- damage by processing, 282
- degradation of, 386
- determination (abst.), 174
- edible, from grass (ed.), 2
- efficiency ratio, 280
- fortification with amino acids, 280
- requirements, 204, 240
- supplements, 240
- vegetable, problem solved, 472
- vegetable, value of, 240

Public Analysts, Association of, 307
Public health (ed.), 455
Public houses, hygiene in (ed.), 48
Public relations officers (ed.), 317
Pulque, 150, 289
Pure Food Centenary celebrations, 399, 445, 451, 488
Putrefaction (*see* Spoilage)
P.v.c., for protective clothing, 117
Pyrethrum, 159
*Pyrex* glass production, 448

## Q

Quality control in factories, 9, 51, 96
Quaternary ammonium compounds, 134, 158
- use of, 156

Quick freezing, equipment for, 295

## R

Radiation (*see* Irradiation)
Rancidity, cause of, 386
Rannoch:
- egg plant (factory visit), 275
- egg tanker vehicle, 402

Rayon for protective clothing, 114
Readership survey (ed.), 497
Recipe programming at Carr's factory, 340
Reed, Albert E., and Co., Ltd., 527
Reclaiming:
- deserts (ed.), 47
- land, 62

Refined foods, change to, 150
Refrigeration:
- and freezing equipment review, 293
- need for adequate (ed.), 91
- plant for meat (abst.), 444

Research in confectionery industry, 13
Retail distribution problems, 326
Rice:
- new milling technique for, 248
- "synthetic", 281

Richmond Sausage, Co. (factory visit), 285
Ringer rinses, 156
*Risotto*, 461
Rivers and lakes, food from, 107
Rodents in food, 325
Roll production, mechanisation of, 56
Rolling of maize grits, 184
Rolls Confectionery, Ltd., 167
Ross Group Ltd., 38
- buy Australian firm, 530

Roughage, need for, in food (ed.), 46
Royal Society tercentenary celebrations, 398
Royal Society of Health congress, 128
Russia (*see* U.S.S.R.)
Rust (*see* Corrosion)

## S

Safety (ed.), 274
Sahara, irrigation of (ed.), 47
Salad cream, 15
Sale of goods, legal aspects, 298
Salmonella in desiccated coconut (ed.), 227
Salmonellosis, through poultry (ed.), 92
Samples:
- legal aspects of, 299
- too many taken? (ed.), 455

Sanitation (*see* Hygiene)
Sanitisers, 158
Sanitisers and detergents (ed.), 134
Sanitising of containers, 154
Sardinia, malaria elimination in, 62
Sauce and pickle manufacture by Geo. Mason, 506
Sauces, and pickles (*annual review*), 14
Sausage casings, 235, 286, 402
Sausage manufacturers' jubilee, 39
Sausages:
- additives for, 74
- canned, X-ray testing of (abst.), 261
- discoloration of, 74
- Frankfurter, cooking of (abst.), 483
- Frankfurter, shelf-life (abst.), 526
- manufacture of, by Richmond Sausage Co., 285
- manufacture of, by Walls, 233
- seasonings for, 71
- skinless, 235, 287

Sawdust, for smoke generation, 417
Scotland:
- Milanda bakery opening in, 209
- news from, 448, 492

Seasonings, 71
Separation of milk-fat triglycerides (abst.), 33
Sewage:
- disposal at Buxted factory, 230
- production of fertilisers from, 64

Shampoos, (ed.), 3
Shelf life, (ed.), 91
*Sherardising*, 469
Ships, meat, 202
Shock-wave process for edible protein (ed.), 2
*Shoppers' Guide*, (ed.), 92
Silos, maize, Brown and Polson's, 140
Simon, Henry, agreement, 38

Slop, are we becoming eaters of? (ed.), 408
Smell receptors, 66
Smoke generator, 417
Smoking:
  electrostatic (abst.), 261
  smoke velocity effect on (abst.), 261
Social habits in food, 68
Soc. of Chem. Ind. Food Group (*see* Food Group)
Soft drinks:
  *editorial comment*, 179, 363
  production, 447
Soil:
  microbiology, 64
  reclamation (ed.), 47
  stabilisation, 62
Soil-making machine, atomic (ed.), 318
Solar cooking (ed.), 364
Sorbic acid, proposal for, as preservative, 38
Soup, sales of (ed.), 178, 498
Sour milk product, 101
Sources of food, 61, 107, 108
South Africa:
  bread enrichment in, 85
  canned fruit prospects (ed.), 2
  food investigations in, 151
  marketing policy in (ed.), 408
  sugar surplus in, 357
South African Fruit and Vegetable Canners Association (ed.), 2
*South Wales Voice*, 48
Soya bean, introduction to Europe, 149
Soya flour, 73
Soya meal supplementation of bread (abst.), 444
Sparrows, canned (ed.), 180
*Spectator, The*, 410
Spices, 71
Spoilage:
  meat, laboratory assessment of, 386
  research by Unilever, 382
*Spratt's Fish*, 412
*Spratt's Meat*, 412
*Spratt's Owals*, 412
Spratt's Patent, Ltd. (factory visit), 411
Sprays, dangerous insecticidal (ed.), 48
Stabilisers, 74
  ice cream, 60, 100
Stainless steels, 462
  food applications, 465
Standards for whole orange drinks (ed.), 363
Starch:
  chlorinated, 143
  composition, 138
  gelation, effect of staling inhibitors, 58
  hydrolysis, 143
  manufacture by Brown and Polson, 137
  pregelatinised, 144
  pregelatinised (abst.), 212
  standards for, 14
  thin-boiling, 143
  uses of, 140
Starch juice purification (abst.), 79
Starvation, spectre of (ed.), 46
Stassanising of milk in Milan dairy, 433
Steak, canned, adulterated (ed.), 1
Steam, waste of, 331
Steels, stainless, 462
Steeping of maize, 139
Steepwater, uses for, 139
Sterilants, 158
Sterilisation:
  by aerosols (abst.), 32
  by radiation (corr.), 213
  by radiation; the end? (ed.), 135
  hot air, 146
  radiation, 146
  use of ethylene oxide in (abst.), 444
  with disinfectants (abst.), 483
Sterilising of containers, 154
Storage:
  cold, ozone treatment in (abst.), 312
  effect of freezing on (abst.), 33
  of butter, 98
  of cream, 98
  of fats, in U.S.S.R., 22
Stork Margarine Works extension, 474
Strawberries, varieties for canning, 145
Strontium uptake by vegetables, (abst.), 483
Strontium 90:
  monitoring arrangements, 305
  removal from milk (ed.), 4
Sucrose, replacement by glucose, 478
Sugar:
  bulk handling in British Guiana, 122
  dissolving at C.W.S. factory, 504
  filtration, 162
  handling, at Macdonalds, 5
  icing, in cake mix packs, 183
  import arrangements for 1960, 82
  invert, use of at Macdonalds, 7
  Mexican production of, 30
  prices of, 11
  refining, 161
  surplus in South Africa, 357
Sugar Board's annual report, 528
Sugar boiling, at Keillers, 52
Sugar refinery in Toronto, 160
Sulphur in spoilage measurement, 388
Supplementation, dietary, effect on growth, 289
Supplementation, excessive, 290
Supplements (*see* Additives, *also under various foods*)
Supplies, of world's food, 61, 107
Survey, readership (ed.), 497
Surveys, consumer, judging results of, 69
Sweden:
  automatic crispbread factory in, 130
  plastic coating of cheese in, 99
Sweets:
  in schools (ed.), 364
  manufacture of by Keillers, 51
Symposia (ed.), 228
Synthesis of food, 109
Synthetic food (ed.), 316


## T


Taiwan (*see* Formosa
Take-over bids (ed.), 89
Tartrazine, B.S.I. standard for, 216
Tartrazine colour, 72
Taste perception, 66
Tasting panels, procedure for, 67
Technologists, food, discussion on (ed.), 361
Teeth, effect of food on, 12, 383
Tenderiser from whey, 101
Tenderisers, meat (ed.), 455
Teenage market (ed.), 228
*Tervlene*, for protective clothing, 116
Tests, chemical, to solve growers' problems (ed.), 1
Testing station for food, 133, 167, 305, 356, 489, 497
Testing station for food (ed.), 497
Texture:
  of peas, 146
  problem of (ed.), 408
  vegetable, 145
Texture, flavour and colour (review), 70
Thanestead Farm, 361
Thawing, rapid method for fish, 352
Thrombosis (ed.), 456
Tilapia, farming of, in Uganda, 408
Tin, determination of (abst.), 350
Tin-nickel plating, 472
Tinplate, use in canning, 333
Tomato:
  as canning crop, 145
  varieties in Italy, 145
Tomato ketchup, 15
*Top Cat*, 412
*Top Dog*, 412
Tortilla, 150
Tote system, 113
Toxicity of printing inks (ed.), 179
Trade marks (*list of recent*), 44, 88, 132, 176, 224, 270, 314, 359, 405, 452, 496, 534
Trafford Park factory, Brown and Polson's (factory visit), 137
Tranquilliser trials for cattle, 198
Transport, manufacturers' private (ed.), 90
T. and G.W. Union, attitude to protein process (ed.), 2
Trawler, factory, 80
Triglycerides, milk-fat, separation of (abst.), 33
Trinidad, sugar production in, 311
Tuberculosis eradication, 198
Tuck shops (ed.), 91
Tunnel Glucose anniversary, 81
Turkey poults, herring feed for (abst.), 79
*Turkey Red* winter wheat, 108
Twinning experiment, 198


## U


Uganda:
  fish farming in (ed.), 408
  nutrition survey in, 288
  tea production in, 310
Ultrasonic determination of pig fat (abst.), 483
Undernutrition, definition of, 328
Unilever, Ltd.:
  food research centre, 382
  margarine works extension, 474
  markets suspect margarine, 493
  markets suspect margarine (ed.), 407
  research centres of (ed.), 3
  working for (ed.), 3
United glass new batch house, 80
U.S.A.:
  beef ageing process in, 311
  bulk handling of flour in, 113
  cheese mechanisation in, 99
  dried milk trends in, 310
  food poisoning by poultry in (ed.), 92
  frozen foods in (ed.), 410
  frozen milk in, 97
  how peas are vined in (ed.), 410
  irrigation projects in, 62
  new cheese variety in, 100
  nutrition congress (report), 472
  nutrition survey in, 288
  pest destruction in, by h/f radiation, 43
  pet food production in (ed.), 409
  pickle consumption in (ed.), 410
  sewage production, fertiliser equivalent of, 64
  sugar industry confusion, 450
  T.V.A. plan, 63
  vending legislation (ed.), 225
  why look to? (ed.), 498
  world nutrition congress in Washington, 85
U.S.S.R.:
  beverage from whey in, 101
  butter production in, 22, 98
  fish industry administration in, 21
  fish research in, 18
  food in, 18
  margarine production in, 23
  storage of fat in, 22


## V


Vaninill, 70
  ultrasonic extraction of (abst.), 33
Vegetable texture, 145
Vegetables:
  canning of, by Lockwoods, 457
  chemical composition, 145
  chemical tests for suitable (ed.), 1
  hydro cooling equipment, 296
  processing of, in Poland, 238
  quick frozen, 1959 production, 307
  research on, by Unilever, 383
  strontium uptake in (abst.), 483
Vending:
  automatic (ed.), 225
  legislation in U.S.A. (ed.), 225
Vending machines and hygiene (ed.), 225
Vermiculite, use in soil (ed.), 47
Vermouth production by Cinzano, 390
Vessels, process, B.S. sizes of, 264
Vietnam:
  advisory nutrition council for?, 268
  dairy plant, 357
Vining:
  of beans and peas, 458
  of peas in U.S.A. (ed.), 410
Vitamin A, determination of (abst.), 350
Vitamin C, 72
Vitamin E in bread (abst.), 312
Vitamins, and relation to amino acids, 242


## W


Wall's:
  new cold store, 167
  progeny testing station (ed.), 271, 361
  sausages (factory visit), 233
Wandsworth factory, Bibby's, 365
Warehousing, 325
Warranties, legal, 298
Wash-waters, bacterial examination of, 157
Waste, avoidance of, 110
Water:
  cycle, in nature, 61
  fresh, from sea-water (ed.), 47
  from unusual sources, 316
  supply, contamination, 155
  supplies (ed.), 273
  waste of, 331
Watercress, hydro-cooling of, 436
Waxing of cheese, 99
*Weetmeet*, 412
Weighing, automatic, at Macdonalds, 7
Westwick Frosted Products, Ltd., instal new equipment, 401
Wet milling of maize, 139
Whales, disappearance of (ed.), 4
Whaling industry of Australia, prospects, 130
Wheat, milling of, 55
Whey:
  as food improver, 101
  Russian beverage from, 101
*Wimpeys*, production of, 56
Wine, production by Cinzano, 390
*World Crops*, 47
World fisheries problems (ed.), 273
World food supplies, 61, 107, 148, 290
World sources of food, 61


## Y


*Yadou*, 101
Yeast:
  cultures of, 106
  cultures, use in wine making, 391
  food from, 109
  plant in Formosa, 516
  use in brewing, 103
Yeast extract, 71
YoYo biscuits, manufacture of, 5


## Z


Zacatepec, sugar co-operative, 30
Zeaxanthin, 72

# AUTHOR INDEX


Aylward, Francis:
World Food Supplies:
1, Sources of Food—I, 61
2, Sources of Food—II, 107
3, Choice of Foods, 148
4, Standards of Nutrition—I, 203
5, Standards of Nutrition—II, 240
6, World Requirements—I, 288
7, World Requirements—II, 327

Bender, A. E.:
"Lysine Fortification of Food", 280
"The Washington Congress", 472
Bennion, Edmund B.:
"The Baking Industry" (*annual review*), 54
Burnett, John:
"The Adulteration of Foods Act, 1860", 479
Burrell, J. R.:
"Pickles and Sauces" (*annual review*), 14

Cass, W. G.:
"Fish Processing in Poland", 238
Cass, W. G.:
"How Russians solve Fat Storage Problems", 22
Cutting, C. L.:
"Russian Fish Research", 18

Dickinson, Denis:
"Canning and Freezing" (*annual review*), 145

Felstead, D. R.:
"Confectionery" (*annual review*), 10

Gooding, E. G. B., Tucker, C. G., and MacDougall, D. B.:
"Dehydration of Carrots", 249

Grindrod, J.:
"How Instant Mashed Potato Flake is made in Canada", 255

Hearne, J. F., and Thomas, R.:
"Gas Packing with Simple Equipment", 420
Hoggan, J.:
"Brewing" (*annual review*), 102
Humphriss, Eric L. E.:
"The Ice Cream Industry" (*annual review*), 59

MacDougall, D. B., Gooding, E. G. B., and Tucker, C. G.:
"Dehydration of Carrots", 249
Mallion, F. J.:
"Meat" (*annual review*), 197
Meston, Lord:
"Manufacturers and the Law: Clean Food", 427
"Manufacturers and the Law: Conditions and Warranties", 298

Orna, N. E.:
"Polish Food-processing Machinery", 237

Scott, L. B.:
"Machines, the Workers' Angle", 330
Sheppard, D.:
"How is Flavour to be Judged?", 66
Sherwood, Peter W.:
"Liquid Nitrogen for Tomorrow's Frozen Foods?", 430
Simons, Eric N.:
"Stainless Steels", 462

Thomas, R., and Hearne, J. F.:
"Gas Packing with Simple Equipment", 420
Tucker, C. G., Gooding, E. G. B., and MacDougall D. B.:
"Dehydration of Carrots", 249
Turner, A.:
"Assessing Meat Spoilage in the Laboratory", 386
Turtle, E. E.:
"Your Pest Problems—what you should know", 324

Walters, A. H.:
"How Clean are your Containers?", 154
Wearmouth, W. G.:
"Dairy Products" (*annual review*), 97
Williams, C. Trevor:
"Glucose in Sugar Confectionery", 476

Number 28 December 1960

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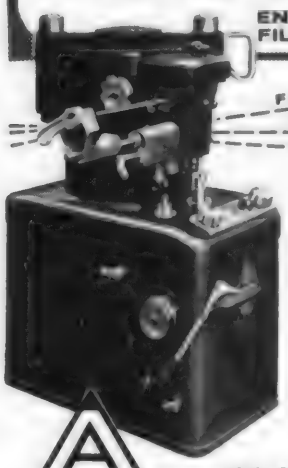


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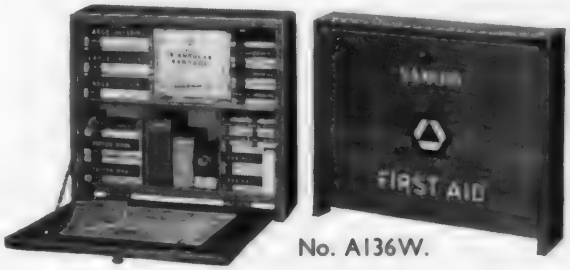


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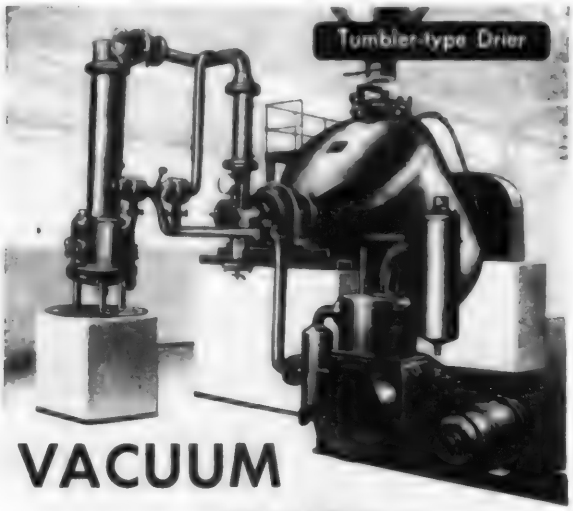


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**Ref. A.852.** British. Male. Single. Age 29. O.N.C. Mech. Eng. 10 years Engineering Assistant, chemical industries. At present Inspection and Liaison Engineer, nuclear engineering. Seeks post as **PROGRESS LIAISON ENGINEER.** Liverpool area. £1,100 p.a.

*(continued overleaf)*

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To: I.S.I.S. Appointments Register, 9, Eden Street, London, N.W.1. Please ask the following applicants to communicate with the undersigned:

| | | | |
|---|---|---|---|
| **Ref.:**_____ | **Ref.:**_____ | **Ref.:**_____ | **Ref.:**_____ |
| **Ref.:**_____ | **Ref.:**_____ | **Ref.:**_____ | **Ref.:**_____ |
| **Ref.:**_____ | **Ref.:**_____ | **Ref.:**_____ | **Ref.:**_____ |

*Please use Block capitals*

Name: _____

Position: _____

Company: _____

Business or Profession: _____

Address: _____

All introductions are made on the understanding that should an engagement result the employer agrees to I.S.I.S. Appointments Register's terms, which are as follows:

*For each person engaged the equivalent of two weeks salary payable by the employer within fourteen days of the date of engagement.*

Signature_____ Date_____

# I.S.I.S. APPOINTMENTS REGISTER *(Continued from previous page)*

**Ref. A.853.** British. Male. Married. Age 35. Ex. Grad.R.Ae.S., F.R.S.A. 2 years Trainee in design and works, aircraft hydraulic engineers. 14 years Design Draughtsman, airframe and ground equipment. 3 months Project Designer, light engineering. 4 years i/c of Production Design and Works Liaison, airframe and equipment manufacturers. At present in charge of Productions Design Office with aircraft manufacturers and designers. Considerable experience on mass production and works management. Seeks post as **DESIGN OFFICE MANAGER OR IN TECHNICAL LIAISON.** U.K.—not London. £1,500 p.a.

**Ref. A.854.** British. Male. Married. Age 26. H.N.C. (Elec.), Grad.I.E.E. 4 years Student Apprentice and 1 year Assistant Design Engineer, electrical engineers. 2 years National Service as radio instructor. 1½ years Design Engineer, rectifier equipment. Seeks post as **ELECTRICAL ENGINEER.** Jamaica or S. Africa. £950 p.a. approximately.

**Ref. A.855.** British. Male. Married. Age 26. O.N.C. Mech. Eng. 4 years Apprenticeship—toolmaker and jig and tool draughtsman. 3½ years Die and Model Draughtsman, precision castings. At present Design Draughtsman, electro servo mechanisms and aircraft fuel systems. Considerable experience in precision foundries on investment casting work (small aircraft parts, turbine blades, etc.) and also interested in chemical engineering plastics. Seeks post as **DESIGN DRAUGHTSMAN.** U.K., Canada, U.S.A. or Australia. £1,000 p.a.

**Ref. A.856.** British. Single. Age 19. G.C.E. Maths and Physics. Experience includes 9 months Junior Salesman, truck and ladder manufacturers. At present Accounts Clerk, purveyors of petroleum spirit. Seeks post as **LABORATORY ASSISTANT.** London. £8 per week approximately.

**Ref. A.857.** Indian. Male. Single. Age 30. **RESIDENT U.K.** B.Sc., H.N.C. Mech. Engg. 3½ years Junior Planning Engineer and 1 year Senior Planning Engineer, Locomotive manufacturers. 2 years Post Graduate Trainee, U.K. locomotive manufacturers. 5 years Mechanical Engineering Apprenticeship. At present Design Draughtsman, special purpose hydraulic equipment. Wide experience pre-production, processing, rate fixing, etc. in production engineering. Seeks post as **PLANNING ENGINEER.** England. £900 p.a.

**Ref. A.858.** British. Male. Married. Age 27. O.N.C. Mech. Studying for A.M.I.E.D. 5 years Apprentice (engineering), precision instruments. 1 year Engineer, precision instruments. 6 months Experimental Technician, aircraft manufacturer. 6 months Experimental Technician, press tools. 1½ years Experimental Technician, atomic energy research. At present Cryogenics Technician, nuclear research, in Switzerland. Seeks **EXPERIMENTAL OR DEVELOPMENT POST.** England or abroad, except Africa. £1,000 p.a. minimum.

**Ref. A.859.** British. Male. Married. Age 25. O.N.C.—2 years—Elec. Engg. Studying for H.N.C. Elec. Engg. 6 months Trainee Draughtsman, heating and lighting engineers. 4½ years Technical Clerk, civil service. 11 months Draughtsman, signals. At present Draughtsman, electrical and signal engineers. Seeks post as **DRAUGHTSMEN.** U.K.—preferably London. £800 p.a.

**Ref. A.860.** British. Female. Married. Age 24. G.C.E. Chemistry and Science. 3 years Laboratory Assistant, medical school. At present Research Assistant, biochemical research. Wide experience analytical methods chromatography, colouremetric, Kjedahl Warburg assays. Seeks post as **TECHNICIAN**—preferably biochemical. Romford/Hornchurch, East London or City areas. £500/£600 p.a. approximately.

**Ref. A.861.** British. Male. Married. Age 28. B.Sc. (Chem.). Since graduating has spent 1 year on research and 3 years on production, with short periods i/c small factory. At present Process Superintendent, fertiliser manufacturers. Seeks **EXECUTIVE/MANAGERIAL POST.** U.K.—not London. £1,125 p.a.

**Ref. A.862.** British. Male. Married. Age 26. H.N.C. Mech. Apprenticeship as Marine Engine Fitter. At present Design Draughtsman, marine engineers. Experienced reciprocating air compressors and refrigeration. Seeks post as **DESIGN DRAUGHTSMAN.** U.K.—not London. £18 per week.

**Ref. A.863.** British. Male. Single. Age 25. Mech. Sciences Tripos Pt. I. (2nd class). Vacation employment includes 3 months Student Engineer, consulting engineers. 3 months Student Trainee, papermaker. 3 months Survey Crewman, consulting engineers. At present Graduate Apprentice, heavy engineering. Seeks **PRODUCTION ENGINEERING POST.** London or abroad. £900 p.a.

**Ref. A.864.** British. Male. Married. Age 52. H.N.C. Mech. Eng., Diploma in Archaeology, A.M.I.Mech. 5 years Student Apprentice, city corporation. 9 years Designer, engineers and instrument makers. 7 years Chief Designer, optical apparatus. 5 years Chief Designer, engineers. 6 years Chief Designer and Manager of Experimental Workshop, optical apparatus. At present Works Manager, engineer and instrument makers. Can undertake styling of products in addition to design and productions. Accustomed complete responsibility of machine design and production. Seeks post as **CHIEF ENGINEER WORKS MANAGER OR DESIGNER.** London or Home Counties. £1,800 p.a.

**Ref. A.865.** British. Male. Single. Age 23. H.N.C. Mech. Eng., G.I.Mech.E., studying for B.I.M. Diploma. 2 years Graduate Apprenticeship, aircraft ancillaries. At present Production Assistant, aircraft ancillaries. Seeks post as **PRODUCTION ENGINEER OR POSITION LEADING TO WORK MANAGEMENT.** N.E. Middlesex. £800 £850 p.a.

**Ref. A.866.** British. Male. Married. Age 35. H.N.C. and Endorsements. 7 years Apprenticeship, aircraft and furniture manufacturers. 4 years Design Draughtsman, photocopying machines. 4 years Design Draughtsman, duplicating machines. At present Development Engineer, manufacturers of oxy-acetylene cutting and welding equipment and machines. Seeks **DEVELOPMENT DESIGN OR TECHNICAL REPRESENTATION APPOINTMENT.** N. and N.E. London, Ware, Hertford or Harlow areas. £1,100 p.a. approximately.

**Ref. A.867.** British. Male. Married. Age 29. B.Sc. (Eng.), D.I.C., A.M.I.C.E., A.M.Inst.H.E. 4 months Assistant Resident Engineer, county council. 7½ years Assistant Civil Engineer, government department. 4 months Site Engineer, civil engineering contractors. At present Design Engineer, civil engineering contractor. Seeks **CIVIL ENGINEERING POST**, e.g. with civil engineering contractor as Project Engineer/Assistant to Contract Manager, or with civil engineering consultant or consulting engineer directly responsible to Partner, or with industrial firm responsible for buildings and services. U.K.—preferably London. £1,300 p.a. approximately.

**Ref. A.868.** British. Male. Married. Age 40. Ground Engg. Certs., B.Sc. (Eng.,) F.S.A. (Scot.) 3 years Planning and Production Engineer, aeronautical engineers. 1 year Chief Tool Draughtsman, pressings, moulds, rubber and plastic and metal components. 1 year Production Engineer, electro-mechanical assemblies. 7 years Senior Tool Designer/Planning and Production Engineer, heating and ventilating engineers. 2 years Assistant Production Manager, metal pressings and fabrications. At present Tool Design Consultant/Assistant Works Manager, precision tools. Seeks post as **WORKS OR GENERAL MANAGER OR PRODUCTION MANAGER.** London or Scotland preferred. £1,750/£2,000 p.a.

**Ref. A.869.** British. Male. Single. Age 32. O.N.C. and H.N.C. Mech., and O.N.C. Elect. and endorsements, G.Inst.Mech.E. 2 years Trainee, builders' merchants. 4 years Engineer, car manufacturers. 2 years Personal Assistant to the Manager, consultant mechanical engineers. At present Technical Mechanical Liaison Engineer, guided missile manufacturers. Seeks **ENGINEERING MANAGEMENT OR JUNIOR TRAINEE POST.** London or U.S.A. £1,100 p.a.

**Ref. A.870.** British. Male. Married. Age 35. Diploma in Public Administration, London Univ., B.Sc. (Economics). Experience includes 4½ years Assistant (Clerical), electricity distribution. 1½ years Costing Clerk, electricity distribution. 6½ years electricity generation and supply, responsible for personnel and establishments administration, printing, stationery, form control, office machinery and equipment. Seeks **MANAGERIAL (PERSONNEL OR ADMINISTRATION) POST.** U.K.—not London. £1,400 p.a.

**Ref. A.871.** British. Male. Married. Age 26. 4 years Airframe Fitter. 1½ years Tool Room work, motor vehicle manufacturers. At present Storekeeper/Buyer, auto research engineer, complete charge of large stores and majority of buying. Seeks post as **BUYER.** U.K. £15 per week.

**Ref. A.872.** British. Single. Age 23. O.N.C. and H.N.C. and Endorsements. 3 years general machine shop training. 2 years Planning experience and at present Jig and Tool Draughtsman, precision machine tool engineers. Seeks post with **CONSULTANT PRODUCTION ENGINEERS.** U.K.

**Ref. A.873.** British. Male. Single. Age 28. O.N.C. 1½ years Design Draughtsman and Section Leader, hydraulic pumps and test rigs and special machines. 1 year Design Draughtsman, contract design office. At present Contract Draughtsman (on loan), motor car manufacturers, design and supervision of installation on site of specialised melting and hot metal handling equipment and general mechanical handling of materials. Seeks post **DESIGN DRAUGHTSMAN.** London or Kent. £1,200 p.a.

**Ref. A.874.** British. Male. Married. Age 30. B.Sc. (Physics and Maths with some Chem.). 3 years Trials Engineer (telemetry), guided weapons. At present Systems Engineer (nucleonics), electronic instrumentation. Seeks post as **ENGINEER (ELECTRONICS, ETC.).** Gloucester, Wilts., Somerset, Dorset, Oxon, West Berks., West Hampshire areas. £950/£1,050 p.a.

**Ref. A.875.** British. Male. Married. Age 32. B.A. (Maths) (Cantab), M.A., B.Sc. Special (Hons. Maths). 1½ years Administrative work, meteorology and aviation. 3 years Group Leader of team of scientists, guided missiles. 5 years Instr. Lt. (R.N.) (Meteorologist). Fluent Spanish and French, some Italian and German. Seeks post as **MATHEMATICIAN METEOROLOGIST OR REPRESENTATIVE.** Preferably tropics or sub-tropics. £1,100 p.a. minimum.

**Ref. A.876.** British. Male. Single. Age 23. G.C.E. "A" Level Advanced Physics, Chem., Pure Maths. Higher Physics to B.Sc. Gen. standard. Chem. Diploma to A.R.I.C. II Standard. 3 months Assistant in Research Laboratory, resin manufacturers. 5 years Technical Staff Trainee, electricity board. At present engaged in Control Operation work—refinery, oil operation department, oil production and refining. Seeks **SUPERVISORY POST LEADING TO MANAGEMENT.** S. America, Central America or Carribbean. £1,200 p.a.

**Ref. A.877.** British. Male. Single. Age 22. H.N.C. Mech. and studying for G.I.Mech.E. 5 years Student Apprentice, aircraft. At present Development Engineer, filtration and silencing engineering. Seeks post as **MECHANICAL DESIGN ENGINEER.** U.K. £650 p.a.

**Ref. A.878.** British. Male. Married. Age 37. O.N.C. (Chem.), Assoc.M.C.T. 3 years Junior Chemist, coal tar and oil distillers. 8 years Technologist i/c powder metallurgy processes, powder metallurgy and non-ferrous wire manufacturers. 9 years experience of plant used in heavy chemical industry, contract engineering, plant commissioning and provision of technical service to clients. At present Sales and Contracts Engineer, engineering organisations. Seeks appointment as **PLANT OR PROCESS SUPERINTENDENT OR CONTRACTS ENGINEER.** U.K. £1,100 p.a.

**Ref. A.880.** British. Male. Married. Age 30. H.N.C. Elect. Engg. 1 year Learner Fitter, general metal work. 3 years Assistant Electrician, repair, installation of electrical plant. 5 years Technician, light electro-mechanical apparatus development and manufacturers. 2 years Design Draughtsman, aircraft manufacturer and guided missile development. At present Senior Design Draughtsman, precision instruments (electro-mechanical). Seeks post as **DESIGN OR PROJECT ENGINEER.** Surrey, Berks., Bucks. or Hampshire. £1,250 p.a.

**Ref. A.881.** British. Male. Married. Age 26. A.M.R.I.N.A., H.N.C. Naval Architecture with Endorsements in Shipyard Practice and Organisation, Advanced Theory and Design. 5 years Apprentice and 3 years Ships' Draughtsman, shipbuilders and engineers. Seeks post with **GOOD PROSPECTS OF LEAVING DRAWING BOARD AND DEALING WITH PRACTICAL ASPECTS OF SHIPBUILDING.** U.K. £18 per week.

**Ref. A.883.** British. Male. Married. Age 28. O.N.C. and H.N.C. Mech. Eng. with all Endorsements for A.M.I.Mech.E., Student of Inst. of Mech. Eng. and Grad. applied for. 5½ years Apprentice, manufacturers of lighting fittings, heaters and general engineers. At present Design Engineer, design manufacturer and maintenance of variety of ground handling equipment for guided missiles. Interested in any position related to **MECHANICAL ENGINEERING ESPECIALLY WITH OIL OR MINING COMPANY AND PREPARED TO UNDERGO TRAINING.** Abroad—any country considered. £1,300/£1,400 p.a. approximately.

**Ref. A.885.** British. Male. Married. Age 38. D.L.C., 2nd Class Hons. Civil Engg., A.M.I.C.E. 10 months Senior Site Engineer, civil engineering contractor. 1½ years Resident Engineers, staff, nuclear power plant. 2½ years Senior Site Engineer, civil engineering and building contractors. 1 year Hydro-electric Design Office, civil engineering consultants. 6 years Assistant Divisional Engineer (4 years on Hydrological Survey), Sudan irrigation department. At present Senior Engineer on river improvement contract, civil engineering contractors. Seeks post as **CIVIL ENGINEER OR HYDROLOGIST.** Will consider any locality. £1,250 p.a. minimum.

**Ref. A.888.** British. Male. Married. Age 51. S.C.P., M.S.A.E., M.B.A.M.E. Very considerable experience of internal combustion engine design work, the application of electronic principles to the automobile industry, as Research and Development Engineer and as a Consultant. At present employed as Independent Consultant. Seeks appointment as **SENIOR DESIGNER DEVELOPMENT ENGINEER.** U.K., Europe or America. £1,500 p.a. minimum.

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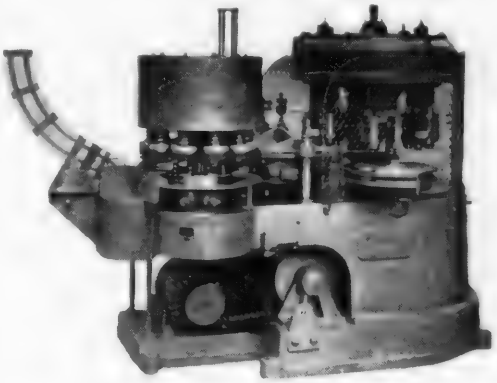

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**THE** proprietor of British Patent No. 713925, entitled *Potato Chip Construction*, offers same for licence or otherwise to ensure practical working in Great Britain.—Inquiries to Singer, Stern and Carlberg, 140, S. Dearborn Street, Chicago 3, Illinois, U.S.A.

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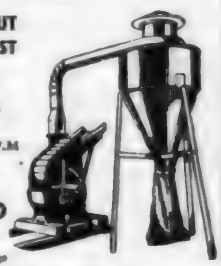

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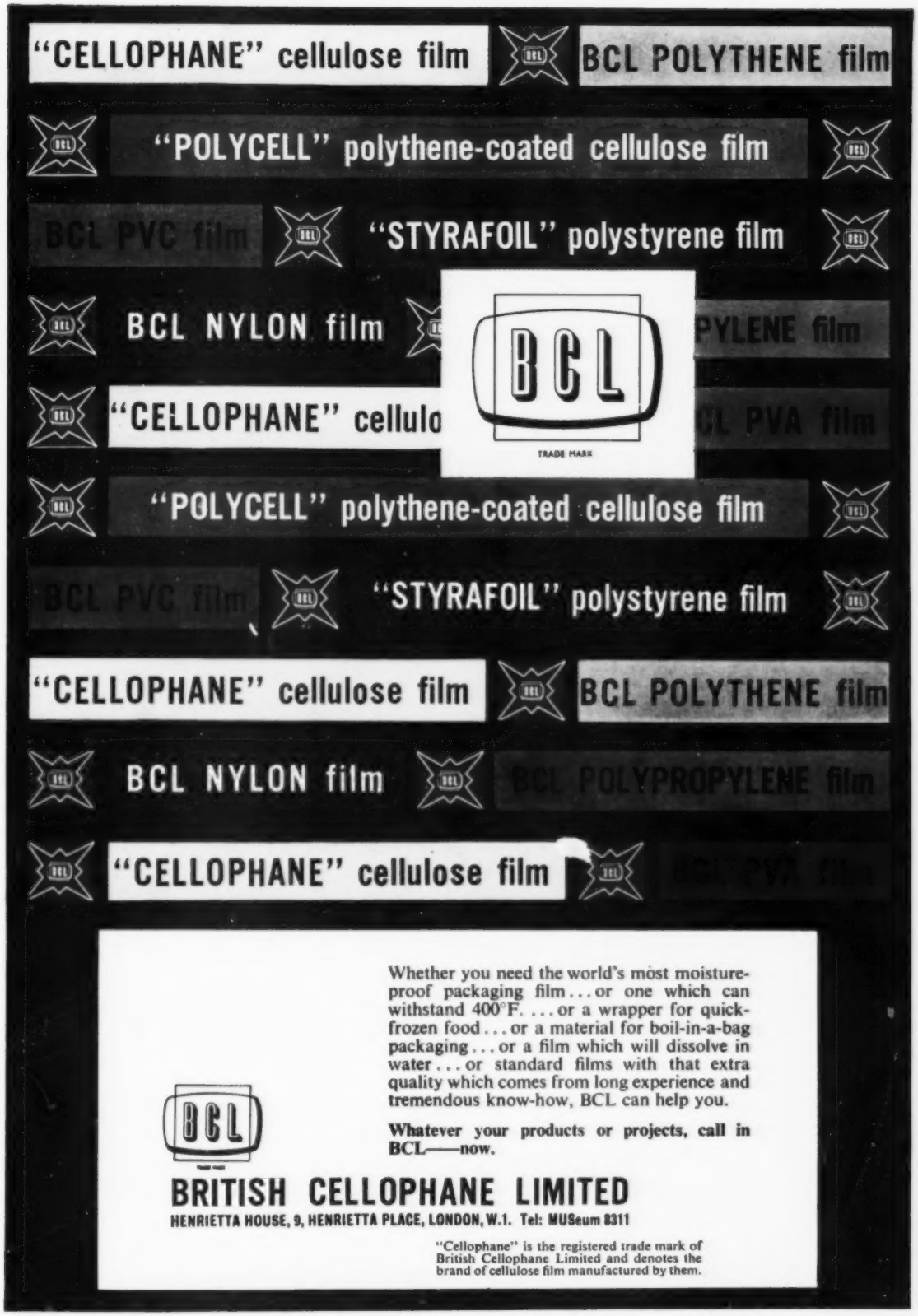
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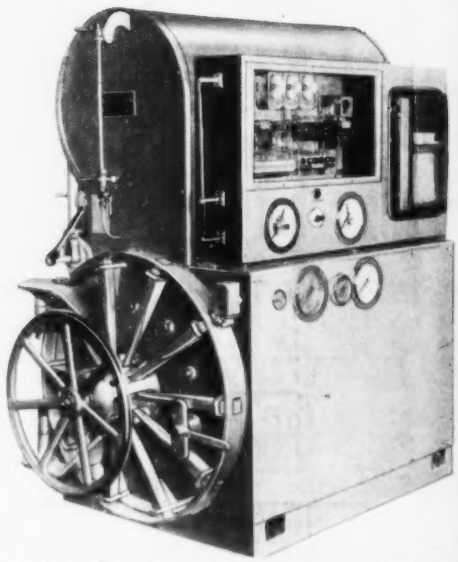

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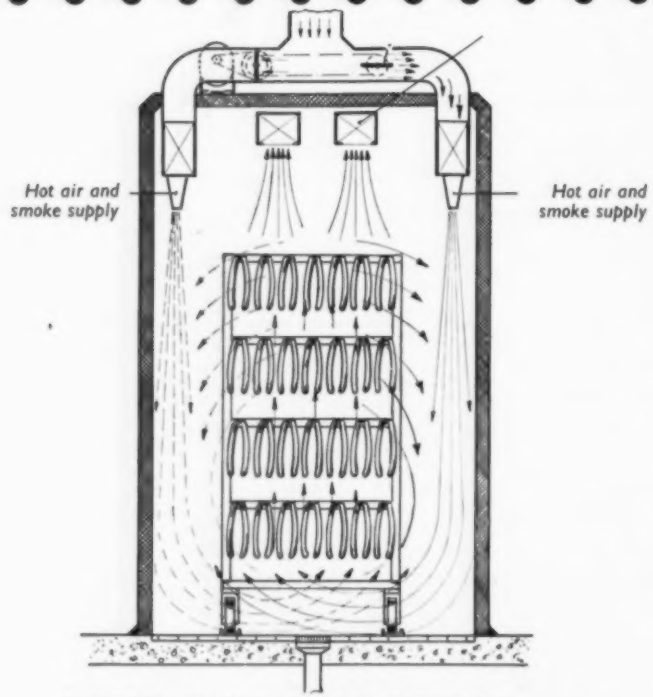


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